ELECTRICAL SOUTH

AUGUST 1945

FANS by HUNTER CENTURY

58th SEASON

52-In Hotel Type

24-In "Allspre Ceilin

HUNTER, who has built fans and ventilators exclusively during 58 years, is now operating under War Production Board restrictions. • No more fans will be made except for the Army, Navy and Maritime Commission. HUNTER unfilled orders now on hand represent contracts with Government Agencies. • Certain sizes of belted exhaust types can be made available for Government hospitals and other war industries, subject to limited material inventories now on hand.

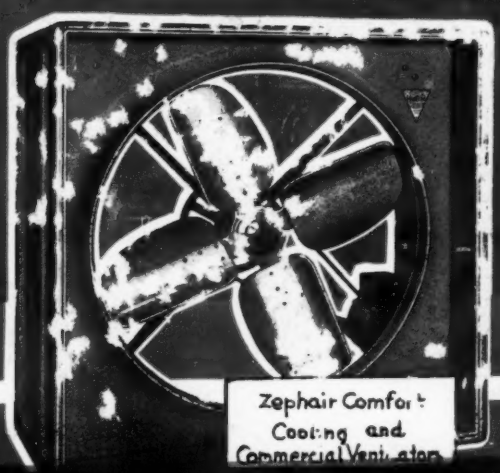
HUNTER FAN & VENTILATING COMPANY, INC

Factory: FULTON, N. Y.

General Sales Offices: Memphis, Sterick Bldg. Eastern Sales Office: New York, 32 Warren Street Western Sales Offices: St. Louis, [illegible]

Sales Offices:
ATLANTA
CHICAGO
DALLAS
HOUSTON
LOS ANGELES
PHILADELPHIA

Sales Offices:
BOSTON
CLEVELAND
DETROIT
KANSAS CITY
NEW ORLEANS
PITTSBURGH



Zephair Comfort Cooling and Commercial Ventilators

SYLVANIA NEWS
CONTRACTOR EDITION

AUGUST *Published by* SYLVANIA ELECTRIC PRODUCTS INC., Salem, Mass. 1945

TRANSLUCENT BASE ROTATES ON NEW CIRCULAR LAMPS

A new rotating base developed by Sylvania Electric appears destined to broaden the postwar markets for circular fluorescent lamps—just as the circular lamps are expected to widen the field of fluorescent lighting itself. With this new base, the pins can be set at any angle to the plane of the lamp.

FIXTURE DESIGN SIMPLIFIED

This feature will greatly simplify both the design of lighting fixtures and the installation of the circular lamps. Translucency of the base is another outstanding advantage, improving the appearance of the lamps.

First Sylvania circular lamp to use the new base will be the 12" diameter size. 8½" and 16" sizes will be introduced later.

Preliminary information on these lamps—not yet in commercial production—is available from Sylvania Electric as a guide in postwar planning.

NEW INSTANT-START LAMPS UNDAMPED BY HUMIDITY

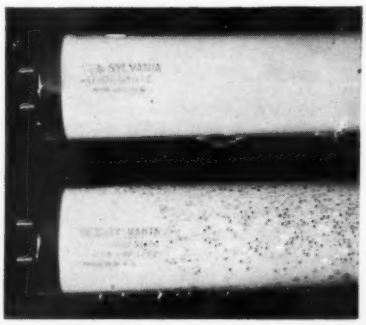
Tube Coating Sheds Moisture, Assures Starting Under Adverse Conditions

Instant starting of fluorescent lamps has now become entirely practicable—even under the high humidity conditions that once made such starting a questionable matter. Instant starting circuits have, of course, been known for some time, but a new Sylvania Electric development now assures their successful operation even under adverse conditions.

SPECIAL COATING DOES THE TRICK

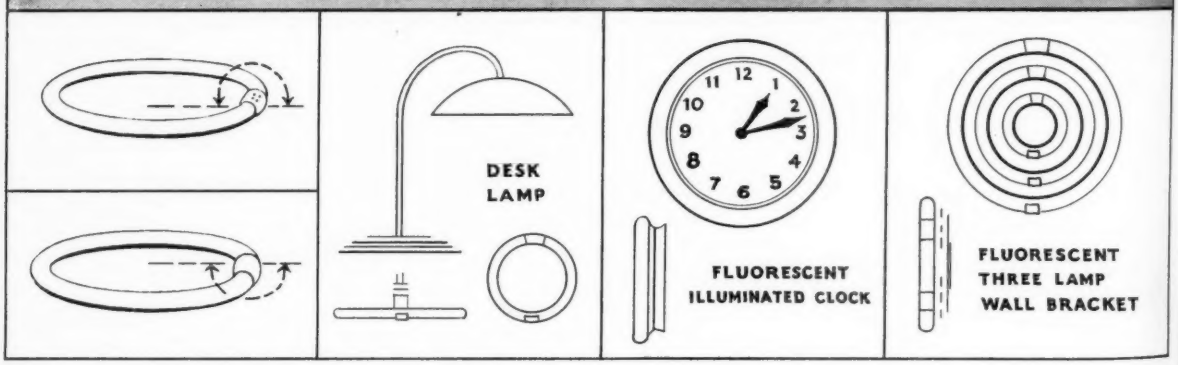
Secret of the new lamps lies in an external coating that keeps the undesirable moisture film from forming—but *does not* affect light output of the lamp. The accompanying photo shows how effective this coating is. At top is a standard 40-watt, T-12 fluorescent lamp subjected to a fine spray of water vapor. Complete coverage is indicated by large drops on underside. Below is a new Sylvania Instant-Start lamp subjected to same treatment. Note how special coating prohibits continuous film of water—moisture collects in tiny drops—each separated from the other by a completely dry area.

The new lamps, currently available



only in the 40-watt T-12 size, require a special ballast, details of which can be obtained from Sylvania Electric.

PREVIEW OF THE ROTATING-BASE CIRCULAR LAMP—AND SOME POSSIBLE USES



SYLVANIA ELECTRIC

MAKERS OF FLUORESCENT LAMPS, FIXTURES, WIRING DEVICES; ELECTRIC LIGHT BULBS; RADIO TUBES; CATHODE RAY TUBES; ELECTRONIC DEVICES

ELECTRICAL SOUTH is published monthly by W. R. C. Smith Publishing Co., Marietta, Ga., and Atlanta, Ga., U. S. A. Subscription rates, United States and Possessions, $1.00 for one year; Canada, $1.50 per year; Foreign Countries, $2.00 per year. Entered as second class matter at the postoffice, Marietta, Ga., under Act of March 3, 1879.

Volume 25 Number 8

VITAL VEINS torn out too soon?

the prevention:

Adequate Wiring

Only adequate wiring written into the plans can protect new buildings against far-too-early electrical obsolescence . . . can provide plenty of power for plenty of years.

Big as today's loads are, tomorrow's will dwarf them. Lighting intensities are still going up. Further increases in demand will be made by air conditioning, fluorescent lighting, electrical office and production machines and electronic equipment — to mention a few of many current-consuming future necessities.

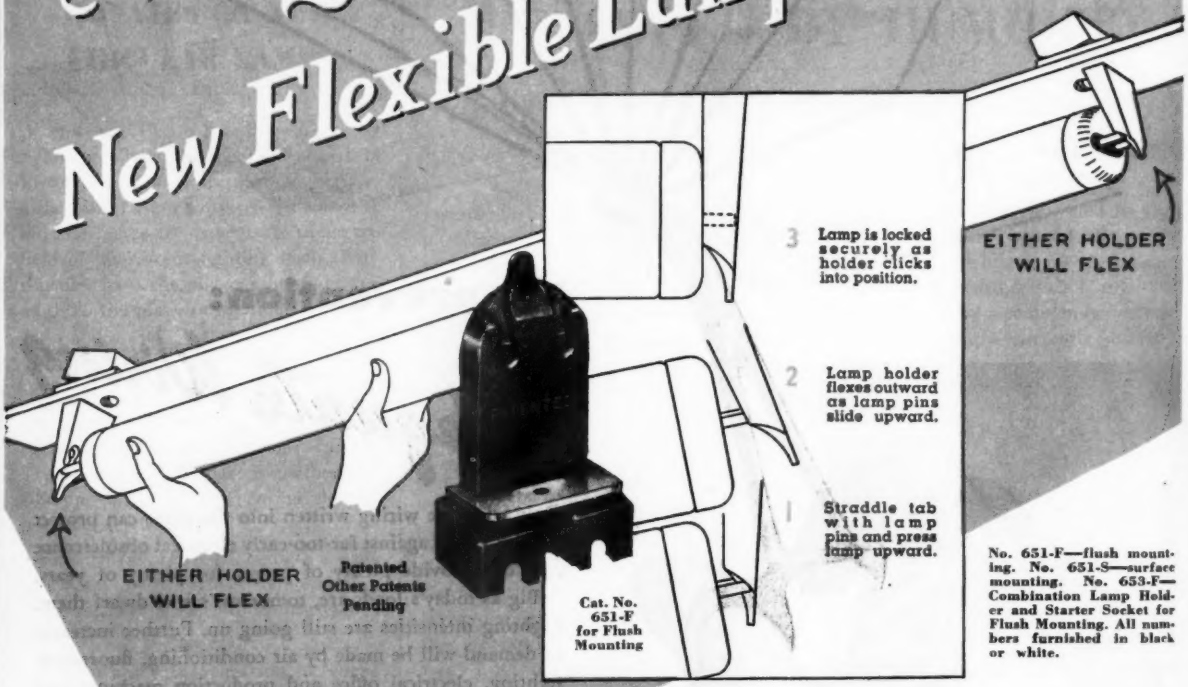
HOW TO BE PREPARED ELECTRICALLY

When planning electrical systems for industrial buildings, commercial buildings and institutions, you can act on this principle: "More Power Sources and More Power at Each Source." For example, you can take one or more of these steps: You can make sure of ample copper in the wires and cables; you can provide more electrical outlets; for industrial buildings you can provide operating economies through high voltage cables and unit sub-stations at load centers. You can provide savings through power factor correction with such equipment as synchronous motors and capacitors. For the right wiring for each particular job, you can go over your plans with a consulting electrical engineer or an experienced electrical contractor or an engineer of The Okonite Company, Passaic, N. J. or The Hazard Insulated Wire Works Division, Wilkes-Barre, Pa.

OKONITE insulated wires and cables

Perfection — *Plus*

Lloyd's New Flexible Lamp Holder


3 Lamp is locked securely as holder clicks into position.
2 Lamp holder flexes outward as lamp pins slide upward.
1 Straddle tab with lamp pins and press lamp upward.
EITHER HOLDER WILL FLEX
EITHER HOLDER WILL FLEX
Patented
Other Patents Pending
Cat. No. 651-F for Flush Mounting

No. 651-F—flush mounting. No. 651-S—surface mounting. No. 653-F—Combination Lamp Holder and Starter Socket for Flush Mounting. All numbers furnished in black or white.

Check These 10 Points of FLEX-LOC SUPERIORITY

1. FLEXIBLE—automatic—self-adjusting to variations in length of lamps or of the spacing of mounting holes in reflector units.
2. AUTOMATIC LOCK is positive. No need for extra locking devices to protect lamp. Absolutely safe. Lamp positively cannot fall out. Holder stands all kinds of shocks and vibrations without loosening contact.
3. SIMPLE yet sure insertion and removal. No twisting. No turning. No fussing to seat lamp in the holder. FLEX-LOC Lamp Holder does the work automatically.
4. PERFECT ELECTRICAL CONTACT made absolutely sure and positive by newly designed patented contacts which grip BOTH sides of lamp pins.
5. NEW STREAMLINE DESIGN — Projecting "tab" on lamp holder serves as a guide for inserting lamp and is a means for removing lamp.
6. SIMPLIFIED MOUNTING — Tapped hole in mounting bracket eliminates need for mounting nuts.
7. ADAPTED TO ALL TYPES OF FIXTURES (Counter lighting, continuous line lighting, in reflectors where limited space makes insertion and removal of lamps difficult.) With FLEX-LOC no turning or twisting of lamp is necessary.
8. TESTED AND APPROVED by testing laboratories. Withstands 2,000 foot pounds high impact shock tests.
9. MOLDED from strong-bodied plastic with high dielectric strength.
10. NO NEED TO CHANGE fixture layout. Engineered to fit all standard fixture spacings.

Lloyd Policy Insures Quality

LLOYD PRODUCTS COMPANY

PROVIDENCE 5, R. I.

Representatives and Warehouses in 23 Leading Cities

Design for Tomorrow

Here are five from a series of "Electric Ranges for Tomorrow," sketched for Electromaster by George W. Walker, noted industrial designer. Probably not more than one—selected by dealers, home economists and utility officials in a nation-wide survey—will reach production. Electromaster is planning carefully to give the postwar consumer *exactly the range she wants.*

This we do know. Every Electromaster range will be up to the minute in construction, operation, and cooking delight. Electromaster engineering has steadily kept pace with Electromaster product design.

The prewar Electromaster Model (shown at right) had illuminated twin-unit oven, automatic signal light for each unit, warming compartment, two spacious ball-bearing mounted storage drawers, and 6-quart Vita-Miser cooker. Thousands of these ranges are providing efficient, trouble-free service.

In some territories dealerships are still available.

MODEL 16-1

Electromaster

1803 EAST ATWATER STREET DETROIT 31, MICHIGAN

The man who gets there faster with . . .

2-WAY FM RADIO

● Did you ever need maintenance in a hurry?

● With G-E 2-way FM radio your service man can be contacted instantly —at all times, anywhere within your system. Regardless of time or place, when the emergency strikes, he can get there faster. G-E 2-way radio is your assurance of that service.

● G-E 2-way FM radio is an effective maintenance tool that will enable you to communicate direct with your field repair crews and enable them in turn to communicate with each other. It is capable of giving reliable, long-range communication under the most adverse conditions, day and night. It will provide the means for immediate dispatch of maintenance crews from one job to another. It will save time when time is most valuable. It will definitely lower maintenance costs.

● Call your G-E sales engineer when you discuss your communication plans. He will assist in planning the most effective 2-way radio system for your particular installation. *Electronics Department, General Electric, Schenectady 5, New York.*

Government regulations now permit new installations of 2-way FM radio for important requirements of utility companies. Your G-E representative will help prepare your application.

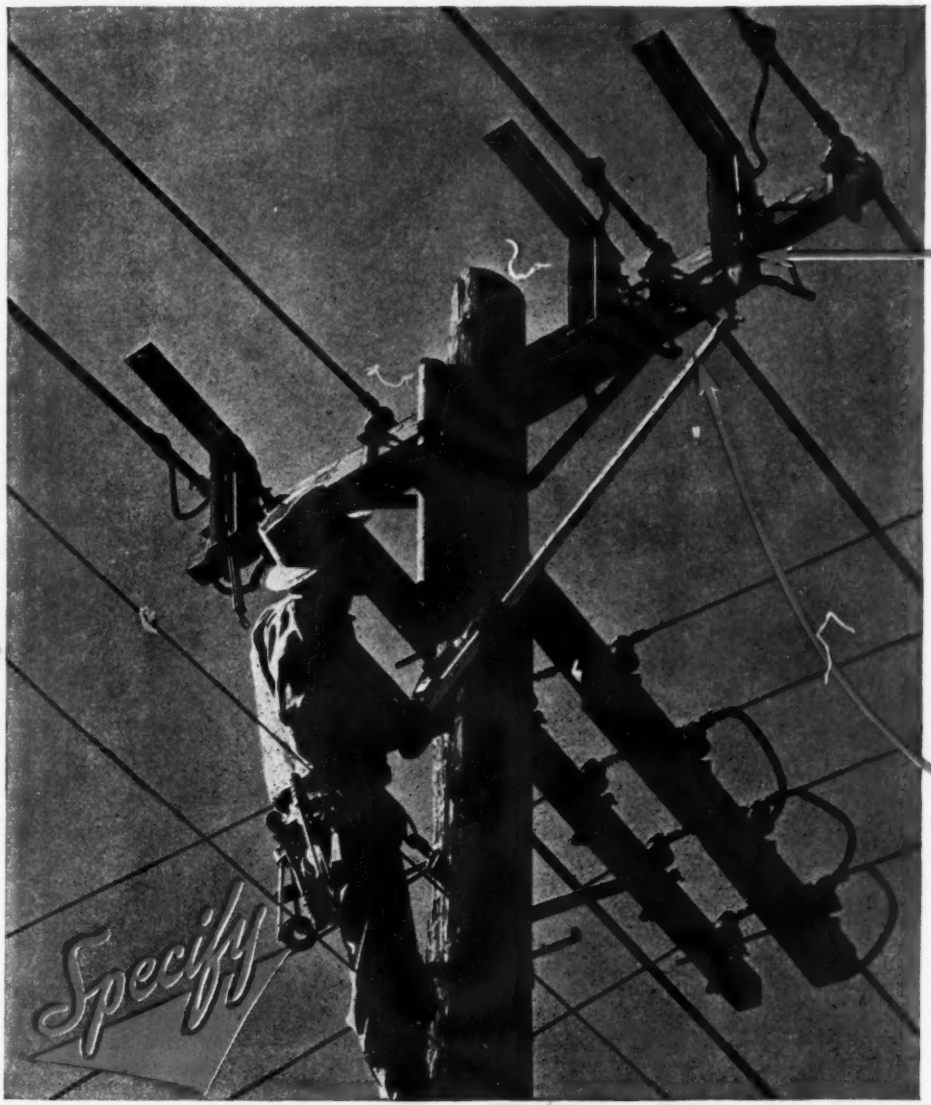
Use G-E Electronic Tubes for maximum communication dependability.

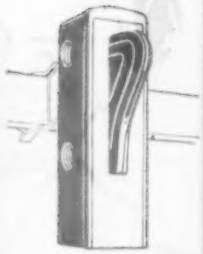
Everything for 2-way radio communication

GENERAL ELECTRIC

163-C14-6918

Better Construction Today–
Less Maintenance Tomorrow





KEARNEY DEAD BLADE DISCONNECT SWITCH

Parallel bus bar copp blades with line pressu contacts and positi latching device are hous in a high quality wet pr ess porcelain box, wi Bakelite door. Special lat permits door to stay op during operation. Lar pull ring is easily reach with hook stick.

KEARNEY HI-LINE DISCONNECT STICK

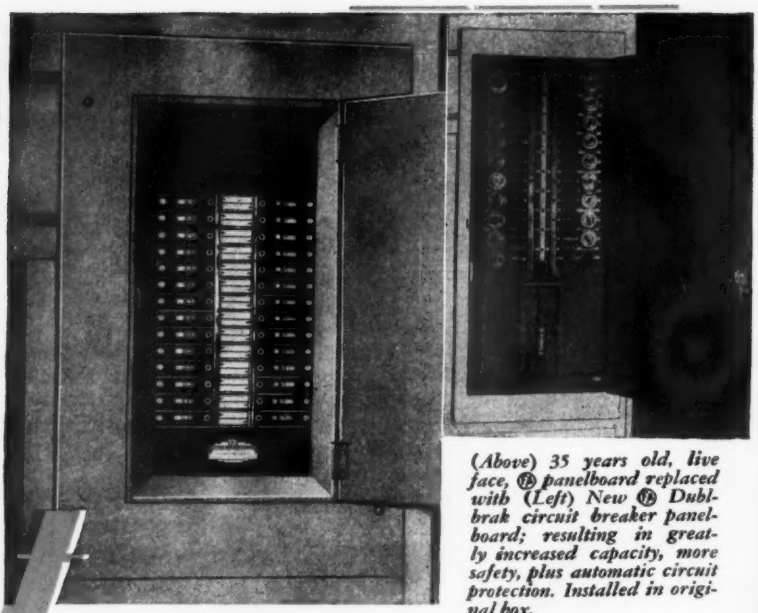
Laminated wood pol with ferrule type met head, securely pressed a riveted on one end. Lig in weight, yet will sta much abuse. Available 1¼" diameter from 4' 12' long, and 1½" diar eter from 10' to 18' lon

KEARNEY PRODUCTS

MADE BY **JAMES R. KEARNEY CORPORATION** 4236 CLAYTON AVENUE SAINT LOUIS 10, MISSOURI

The Right PANELBOARD is Money in the Bank

for NEW CONSTRUCTION
for RECONVERSION
for MODERNIZATION



(Above) 35 years old, live face, (FA) panelboard replaced with (Left) New (FA) Dublbrak circuit breaker panelboard; resulting in greatly increased capacity, more safety, plus automatic circuit protection. Installed in original box.

There are many different kinds of panelboards, your problem is to select the right one. Advancements in electric application frequently obsoletes control equipment unless foresight is used in its selection. And this is where we can help you.

Your industry will need thousands of new panelboards for modernization, reconversion and new construction to economically utilize new improvements in electrical equipment. *And there is a standard (FA) Panelboard for almost every job.*

Factories . . Offices . . Stores

Automatic circuit breaker Panelboards provide unexcelled protection for lighting and small appliance circuits, and materially reduce maintenance costs for all types of large buildings. Small stores, garages and other similar industries find circuit breaker or switch and fuse panelboards equally suitable. (FA) Feeder distribution panelboards for industry are assembled with standard units, perhaps of several types, to meet exact requirements. Whatever your requirements may be, our half century of experience devoted exclusively to power distribution and control is at your service.

★ **DUBLBREAK (NA1B) (Illustrated)**
15 to 50 ampere AC or DC automatic circuit breaker type, with fast double make and break connections.

★ **THERMAG (NAC1B)**
15 to 50 ampere AC circuit breaker type. Dual thermal-magnetic trip with time-lag allowance.

★ **LEADER (LNT1P)**
30 ampere tumbler switch and plug fuse in moulded bakelite, four circuit unit sections.

★ **DUST-TIGHT**
Lighting and Power panels in specially built cabinets for hazardous locations. 15 to 600 amperes, 250 and 600 volts.

★ **NARROW COLUMN**
To fit 8", 9", 10" H columns or the narrow space between windows. Made with Dublbrak or Thermag circuit breakers.

★ **PULFUZSWITCH**
Horsepower rated pull-out type switch. 30 to 100 amperes, 250 volts — 30 to 60 amperes, 575 volts.

★ **KLAMPSWITCHFUZ**
Horsepower rated 30 to 1200 amperes, 250 and 575 volts. Hinged door holds both switch and fuse.

EST. 1891 — THE SIGN OF A BETTER JOB
Frank Adam
ELECTRICAL PRODUCTS
FRANK ADAM ELECTRIC CO. ST. LOUIS, MO. U.S.A.

A TRACE OF Li*

and Burndy adds 20% to the strength of cast electrical CONNECTORS

Continuing its leadership in connector development, Burndy now supplies cast electrical connectors made from Burndy alloy #113L . . . a new high-copper alloy containing *Lithium. This important addition of Lithium, in correct amount, provides denser, finer grained castings . . . with tensile strength increased 20%, elongation increased about 20%, and coefficient of friction materially reduced.

Thus today, Burndy cast electrical connectors provide an even *greater* margin of superiority than in the past. Far stronger and tougher, they can be installed with greater applied pressure, and are more readily conformable to the conductor . . . assuring a tight, durable, full-contact-area connection.

For complete information on these or any other type of electrical connectors, write connector headquarters . . . Burndy Engineering Co., Inc., 107-H Bruckner Boulevard, New York 54, N. Y.

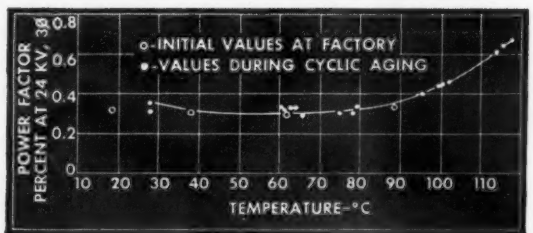
Headquarters for CONNECTORS

Burndy

In Canada: Canadian Line Materials, Limited, Toronto 13

Oxidation CONTROL

with Type CB (CARBON-BLACK) CABLE



Cyclic aging tests have been conducted by a utility laboratory on Type CB (carbon-black) Cable at temperatures up to 117° C and at double operating voltage. At the conclusion of these tests, the power-factor/temperature characteristics were exactly the same as initially.

Not one report of electrical failure of Type CB (carbon-black) Cable in service!

Special, adsorbent carbon black prevents oxidation and breakdown of oil—Anaconda carbon-black paper adsorbs oxidation products caused by heat and electrical stress, and also reduces ionization discharges, dendrites, wax formation.

Can carry emergency loads safer—Type CB cable construction definitely increases high temperature stability of the cable. Accommodation is provided for emergency overloads which ordinarily may lead to excessive dielectric losses and permanent cable damage.

More for your cable dollar—Obviously Type CB Cable offers longer life and greater efficiency than ordinary paper-insulated cable. Ask to see graphic demonstrations of Type CB Cable superiorities. 45765

ANACONDA

Anaconda Wire & Cable Co.

GENERAL OFFICES: 25 Broadway, New York City 4 — *Subsidiary of Anaconda Copper Mining Company*

CHICAGO OFFICE: 20 North Wacker Drive 6 • Sales Offices in Principal Cities

ELECTRICAL SOUTH

VOL. 25 AUGUST 1945 NO. 8

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SOUTHERN AUTOMOTIVE JOURNAL
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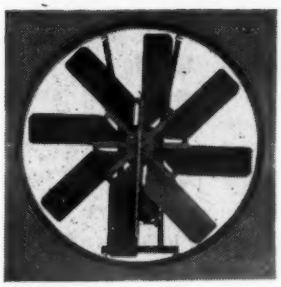
"Yes, sir! Those bearings are one of the sweetest features on the Coolair fan . . . and that's saying plenty!

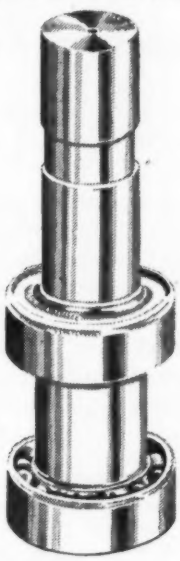
"They never develop chatter like sleeve bearings do, because these deep groove ball races take care of both thrust and radial loads. That's why you can mount the Coolair fan in any position you want to, as long as you specify a ball bearing motor.

"And the Coolair fan shaft is precision-machined out of cold rolled stock with turned shoulders so nothing can ever work out of place. The stubby, thick shaft can't develop any whip, either.

"Don't ever remember having a bearing go bad . . . and I've got plenty of customers who've been running their Coolair fans day in and day out for years . . . and they are the best fan salesmen I've got!"

Coolair
TRADE MARK





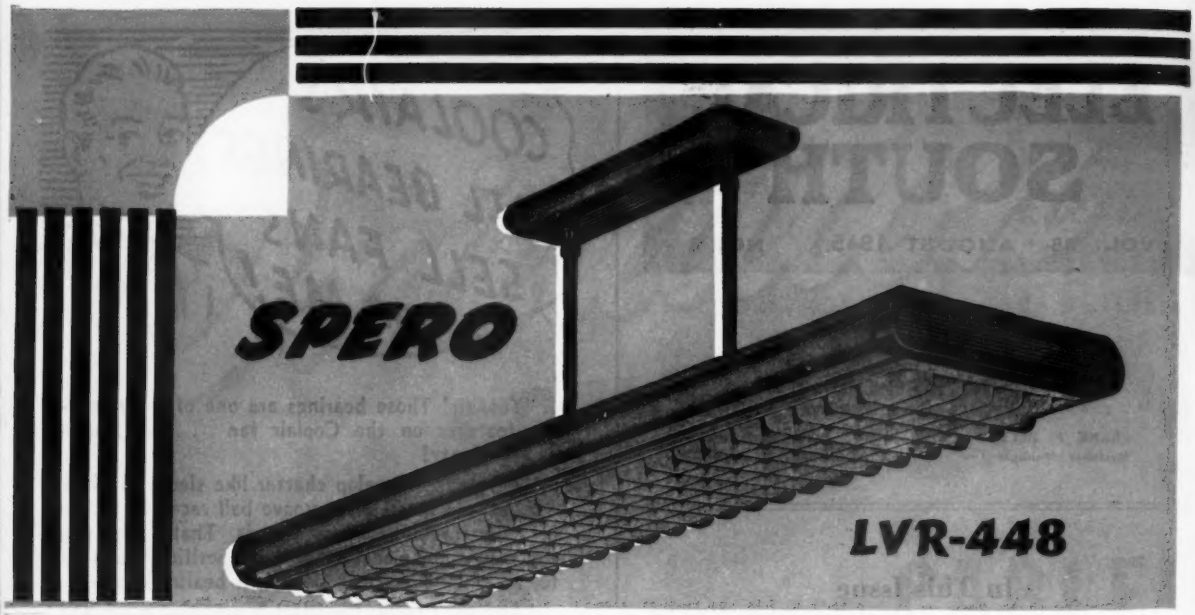
RIGHT: Sketch of fan shaft and bearing assembly, showing the two single row, deep-groove, oversize ball bearings that keep the Coolair fan running quietly for years.

A full description of the Coolair line, with tables showing models, dimensions, performance data, etc., can be found in SWEET'S CATALOG A.S.H.V.E. GUIDE ELECTRICAL BUYER'S REFERENCE

AMERICAN COOLAIR CORPORATION...Manufacturers

3604 MAYFLOWER STREET

JACKSONVILLE 3, FLORIDA



MASTERPIECE *of Fluorescent Engineering*

The ideal commercial fixture . . combining highest efficiency, modern design, minimum glare and low maintenance costs

All the elements of correct design have been incorporated in this outstanding fixture. The light from the four 40W tubes is shielded by evenly-spaced egg-crate louvres, minimizing glare. Reflecting surfaces, finished in "Plastox" white (88% reflection factor) are so arranged as to eliminate "trapped light" — resulting in high intensity with low surface brightness. Plastic side panels shield end tubes and contribute to the smart streamlined appearance of this modern unit.

Made for stem or flush mounting. For stem mounting unit is equipped with an attractive ceiling canopy. Louvres are hinged for easy maintenance. Available with Spero Insta-lite—providing instantaneous lighting and still further reducing maintenance costs by eliminating starting switches.

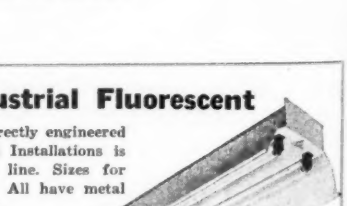
NOTE TO WHOLESALERS: Now is the time to become the distributor for this exceptional unit, the Spero LVR-448. Write for details.

THE SPERO PLANT STANDS BEHIND THE ELECTRICAL WHOLESALER

In spite of shortages and restrictions, Spero has continued to make and supply customers its regular line as far as possible. Spero products are sold only through legitimate electrical wholesalers.

Spero Industrial Fluorescent

A complete line of correctly engineered fixtures for Industrial Installations is offered in the Spero line. Sizes for 40W and 100W tubes. All have metal reflectors, with reflecting surfaces finished in "Plastox" white. Available with Insta-lite.



THE SPERO ELECTRIC CORPORATION

18222 LANKEN AVE. ★ CLEVELAND, OHIO

ELECTRICAL FEATURES OF THE BIG INCH

By Merritt A. Hyde*

FOR more than a year now, America has had a long-range weapon that is by far the largest of its kind; a double-barreled gun pointed straight at the heart of its enemies. And we've been "letting them have it with both barrels," unceasingly, day and night, as the results have shown.

One barrel of this rifle is two feet in diameter and 1400 miles long. It's called the Big Inch Pipe Line, and it shoots a stream of crude oil, of some 320,000 barrels per day, from the great producing area in the Southwest to the refineries on the Eastern Seaboard.

The second gun barrel is a mere 20 inches in diameter, so it is known as little Big Inch. It spews about 225,000 barrels per day of gasoline from the refineries of the Gulf Coast to New York Harbor, a distance of 1600 miles.

Much has been written and spoken about the planning and building of these lines, a feat that has made Big Inch another American by-word of construction accomplishment. But for engineers, there is a special interest in what makes them go, and this discussion deals particularly with the part played by electricity in their operation.

"Big Inch," the 24-inch crude line, is a 1400-mile underground conduit, 24 inches in diameter for 1,264 miles of its length, from Longview, Texas, to Phoenixville, Pa. There it forks into two 20-inch lines, one to the Philadelphia area, totalling some 40 pipe miles, the other about 90 miles to the New York area.

The route encounters all varieties of terrain, ranging from the Mississippi bottoms to the ridges of the Alleghenies. Between an elevation of about 300 feet at Longview and sea level at its eastern terminals, its highest point is the 2900 foot Laurel Hill crossing, in Pennsylvania.

Fig. 1. Route of the Big Inch Pipeline—Texas to New York.

Operating at capacity, the line carries a continuous 1,400-mile column of oil, more than 4,000,000 barrels of it, weighing 600,000 tons, moving at a speed of about 4-1/4 miles per hour. To accomplish this requires a total propelling force equivalent to about 4000 tons. This force and rate of motion represents the expenditure of nearly 100,000 horsepower, by that measure one of man's greatest pumping jobs.

130,000 Hp in Pumping Plants

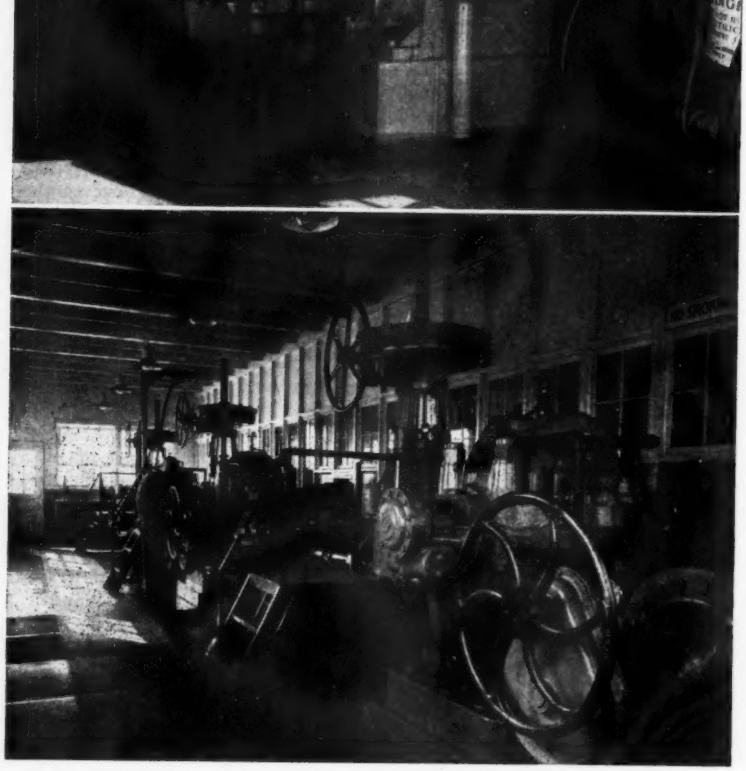
The task is performed by electrically driven centrifugal pumps. The aggregate installed motor capacity applied to mainline pumping is approximately 120,000 horsepower, in 80 units of 1,500 horsepower each, in 26 stations at intervals averaging about 52 miles, with generally three units per station. Additional spare and auxiliary units bring the total installed horsepower to about 130,000.

Even in these days of big numbers, the installation of 130,000 horsepower of motors in a pumping plant is something unusual. Such a plant would tax the full capacity of TVA'S Norris Dam generating station. However, the real interest in this project is not in its size, but in the nature of its operation. It is one thing to build a 130,000 horsepower pumping plant on some particular site. It is quite another matter to set up the same capacity in 26 separate stations performing a single pumping operation, yet extended over a 1,400-mile strip of ground as illustrated in Figure 1.

Now the whole character of pipeline operation stems from subdivision into stations separated geographically but joined physically. The use of a number of stations along the line instead of at the origin is dictated, of course, by the necessity of limiting the station delivery pressure to a value that develops a piping stress within the allowable limit.

Considering the section of line between Longview and Phoenixville, if the pumping capacity could be com-

*Adapted from a talk before the Michigan Section of the AIEE. Mr. Hyde is associated with the Westinghouse Electric Corporation.



bined into one station at Longview, delivering 300,000 barrels per day through 1264 miles of 24-inch pipe, with a pressure drop per mile of 12 pounds per square inch, and against a static head of 50 pounds per square inch due to net difference in the two station elevations, then Longview station would have to operate with a discharge pressure of 15,250 pounds per square inch!

Of course, this is an impractical condition from the standpoint of pipe design alone. But by dividing the job among 24 stations along this section of the line, the average net pressure developed at each station becomes about 635 pounds per square inch. Allowing for a suction pressure at each station of 50 pounds per square inch, the station discharge pressure would be 685 pounds per square inch. In actual operation, capacity flow is somewhat higher than the 300,000 barrels per day nominal rating of the line, and the net input pressure at each station is in the neighborhood of 675 pounds per square inch. With a suction pressure of 50 pounds per square inch, this means a maximum line pressure at the station discharge of 725 pounds per square inch, a practical value from the standpoint of pipe design.

The average spacing for 24 stations over this 1264 miles of line is 52.5 miles. Actually distances between stations vary from 31 to 78 miles, the spacing being closer for uphill and wider for downhill terrain. In each case the spacing is such that the pressure increment developed by the station is equaled by the static-head difference between that station and the succeeding station, plus the friction drop at capacity flow for the length of piping between the two stations.

In the course of 1,400 miles of right-of-way, it is to be expected that a variety of power-service conditions

Fig. 3. (Top) Typical installation of full-voltage starting switchgear. The two left-hand units form the potential and operating transformers and the main circuit breaker, with metering and relaying for the incoming line. The remaining three units each control one 1500 hp pump motor.

Fig. 4. (Center) Three 1500 hp motors driving main line pumps on 24-inch line. Each drive is through a stuffing box in the partition separating the pump room from the motor room.

Fig. 5. (Bottom) Pump room of typical Big Inch station. Note explosion-proof type electrical fixtures for use in hazardous locations of this nature.

will be encountered. Power is delivered to the station sites by 16 different utility companies. New power line constructions varied from 1/10 mile up to, in one instance, 120 miles of line for serving three station sites. Service voltages range from 22,000 to 110,000 volts. In all stations the bus voltage is 2,300, stepped down from service voltage through one three-phase transformer rated, in general, 3,750 kva. The transformer-substation installation includes primary disconnect switch, lightning arresters, and fuses and a typical substation appears in Figure 2.

From the outdoor substation, power enters the pumping-station switchgear at 2,300 volts. In this switchgear it passes through a main breaker and thence to a bus from which it is tapped to each motor through suitable starting equipment. This starting equipment is of the full-voltage type wherever the power-service facilities are adequate to handle the across-line starting current of the motors, which is about five times the full-load current. The current demand for the station with two units operating at full load and the third unit starting at full voltage, is about 200 per cent of the running current for 3 units. In 13 of the 26 stations, reduced voltage starting was deemed necessary. The more elaborate starting equipment in these stations reduces the maximum demand during starting to about 150 per cent of the running current for 3 units. Typical full-voltage starting switchgear is shown in Figure 3.

Each motor control unit provides time-delay undervoltage protection, and also instantaneous short-circuit protection, and locked-rotor protection. Running load protection is provided by a thermal relay which follows closely the heating characteristic of the motor.

The switchgear is of the metal-clad type with vertical-lift breakers, providing the ultimate in safety, interchangeability, and complete factory assembly —outstanding advantages for pipe-line station service. A single spare circuit breaker is interchangeable in all the units.

The motors are of the squirrel cage induction type. Their ventilation is by air intake at both ends, with discharge through an opening in the top of the motor frame. Each motor is installed with a so-called "top hat" through which the warm discharge air is drawn into a duct and expelled through the roof by a small motor blower. Provision is also made for

(*Continued on page 78*)

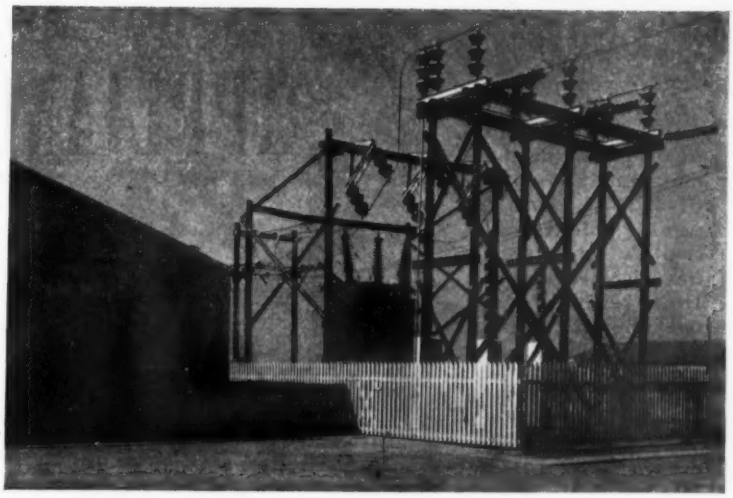


Fig. 2. Power service facilities at one of the Big Inch stations operating from a 110,000 volt transmission line.

Fig. 6. (Above) Station chief and operator at control desk in one of the 20-inch line stations.

Fig. 7. (Left) Typical view of stations along the Big Inch and the Little Big Inch Pipelines.

APPLIANCE DEALERS

Time is running out on the appliance dealer who hasn't made plans for the day when merchandise is available again. Electrical South's reporters have been surveying the field to determine what some of the leaders are planning.

Strong Displays Feature Barnett's Future Plans

WHEN electrical appliances stream back full flow to satisfy the consumer demand pent up during war years, stores that reap the richest harvest of dollars will be those that planned in advance to be Johnny-on-the-spot.

One of the largest appliance merchandisers in New Orleans before Pearl Harbor was the Max Barnett Furniture Co. After appliances return, they're going to be an even larger merchandiser. All the planning necessary to stock, lay out, and promote a mammoth electrical department has been done already—in advance. Barnett's is ready to roll at a moment's notice.

"Appliances will occupy half the first floor—where customers can't miss the displays as they enter," says Manager R. J. Magoni. "Later we plan to use all of the big street floor. We'll carry a stock as complete as any retail outfit in the South, including many different lines of every major and minor appliance made. And we're going to push the department with heavy advertising when the time comes."

The largest furniture house in New Orleans, Barnett's has always been a big appliance operator as well. Appliance selling, the store's executives recognized many years ago, is a great volume builder—and profit maker.

Barnett's was going strong with a department stretching from the store's main entrance to the rear floor selling space, when war cut short all appliance selling. Appliances were pushed with many pages of newspaper advertising each week, plus direct mail and radio. Barnett's executives know how to promote heavy sales.

War ended the profitable appliance business, but they began laying plans immediately to have an even greater department after the merchandise returned. Concentrating on immediate "good will" merchandising, they nevertheless made concrete plans to be ready the moment appliances were available to catch the first rush of the buying spree they knew would come—and build on such a firm foundation that after the first spending jag ended, they would be prepared for strong year-in-year-out electrical merchandise selling.

Now that reconversion orders have released the manufacturing of some appliances, they're ready to go as fast as the merchandise arrives. Years of preparation have perfected every selling plan, right down to the last appeal and the last inch of advertising.

The location on Barnett's busy street floor is ready, with flood lamps now in place for the kind of "highlighted" strong display Magoni stresses.

"We're building a bank of merchandise," he explains. "I like *strong* displays—displays that hit customers in the eye the moment they enter our doors.

"Along each wall, we'll have 'banked' merchandise: refrigerators on the floor, refrigerators on stands, mammoth signs and displays. No 'line 'em up and pick 'em out' stuff for us; we make real displays of the merchandise itself rather than just put it on the floor and wait for customers to look at it. They *have* to see ours.

"One section will be devoted to refrigerators alone, another to washing machines, with places for vacuum cleaners, radios, and all the other major and minor appliances. Each section will be a self-contained unit rather than sprawling the department over the whole floor.

"In the center, down a corridor that leads from our main entrance, will be the principal highlighted display. One week it may be a refrigerator, the next a washer. I don't like 'static' displays. This will stand on a bankment—already in place and waiting for the merchandise—and strong spotlights and flood lamps will play on it. Customers entering the store for any merchandise can't miss such a display.

"At first, the appliance department will occupy a gigantic L-shaped space covering most of the first floor. Later, as more merchandise arrives, we'll take over the entire floor and build one enormous display there that will hit them when they enter like the blow of a pile driver."

Magoni's department will carry many brands in each appliance line. "Customers are bound to find the one they want here," he boasts. Electric refrigerators will include Kelvinator, Philco and Westinghouse. Washers: Bendix, Thor, Westinghouse, and Speed Queen. Philco, Zenith, RCA, Stromberg-Carlson, Westinghouse and Emerson radios will cover the radio section. Ironers in stock will be Thor and Iron Light; vacuum cleaners, Eureka and Royal.

"That's just a sample," declares Mr. Magoni. "We'll have the most com-

(Continued on page 76)

Typical advertising copy being used by Barnett's, of New Orleans.

MAKE THEIR PLANS

Here are briefs describing the activities of several different types of dealers. They may view the appliance market from different angles but one fact is apparent: they are all making plans! Every dealer should ask himself "Am I ready?"

Rural Market Prospects Good in North Carolina

AN ELECTRICAL appliance store that can compete with city stores in range of supplies and variety of appliances is being opened in Salem, N. C., as a part of the operation of the Salem Hardware Company, which is owned by R. M. Johnston.

Salem is located in a rich agricultural center not far from Charlotte and thousands of farms in the area are connected to either power company or REA lines. Thousands of others are getting ready to become users of electricity and to take advantage of electrical living.

Mr. and Mrs. R. M. Johnson, owners of Salem Hardware Co., of Salem, N. C., examine promotional material on their new appliance line. Below, an exterior view of the Salem Hardware Co.

"We have been in the appliance business for a number of years," Mr. Johnston said, "and each year saw us make some improvement since we started out with a counter of electric supplies.

"We have studied the market and the possibilities, and we are now convinced that only a complete line, from outlet plug to a completely equipped kitchen and laundry, will satisfy our customers and potential customers."

"Consequently, we are building a complete new department," Mr. Johnston continued, "and will have the most modern accommodations for appliance customers."

Here is the market in North Carolina as arrived at from study of REA charts and by personal investigation. Nearly 100,000 farms are served by the REA alone; several thousand are served by regular power lines; and there are several thousand more prospects in the border line areas where local power lines reach out into the immediate farm area outside the large and small cities. Other prospects are the residents of smaller villages.

Experts estimate that the REA connected users, plus the users expected to be connected in a three-year period in North Carolina, will buy about $98,000,000 worth of wiring and appliances. Most of them will buy more than the estimate, and more will be connected to the lines than the estimate. This is based on past experience with unwired farms near power lines.

Unconnected farms in North Carolina number about 312,000, and this number are prospects for current and subsequent supplies. This gives the small town appliance operator a long-time view of the rural aspects of the business.

"These prospects are not going to be satisfied to shop from a catalog or a small stock," Mr. Johnston said. "They are people of means. They can go fifty miles or one or two hundred miles if they wish to see the merchandise they want. They read the same ads and take the same magazines that we do. They are almost, without exception, fully informed. Because they are, they will know a good appliance store when they see it, and they will recognize the nationally advertised merchandise. Two things that might have been hurdles in the way of selling the rural population are thus removed."

Mr. Johnston said that not only were they going to stock a complete line of appliances, but that they intended to inform the prospective customers of this by newspaper and direct-mail advertising. An important part of his plan will be an organized effort to sell associated merchandise, and complete control of credit so that those so entitled may continue to add new items to their contract.

One advantage of a full line, as will be pointed out, is that appliances of low cost can be sold to persons on a time payment basis whose contract and credit would not stand the addition of another higher priced appliance. Lack of these smaller items in stock would mean losing these sales and, subsequently, less volume for the appliance store.

Here is a resume of the line, already contracted for, that will be stocked by Salem Hardware Company:

Electric irons will be carried in several sizes and styles. They will have a steam iron, an automatic temperature regulated iron; a 1000-watt 4-lb. iron; a 1000-watt 5-lb. iron and a regular 660-watt 5½-lb. iron.

The woman just doesn't live that hadn't rather shop through all these irons than to buy where she had the choice of one in stock and three in a catalog.

This scheme will be carried out in the stocks of toasters, where fully

automatic, semi automatic, and straight will be available. Coffee makers, automatic electric roasters, and variable speed mixers will be in variety.

The fan department of most electric appliance stores is a sort of orphan child that gets a lot of attention when the weather is hot and is neglected the rest of the year. Mr. Johnston intends to do everything he can to sell a kitchen exhaust fan with every electric kitchen, particularly those that go into new homes. It is much easier to add this fan in the contract at this time than it is to sell it later, because it can be installed with the kitchen.

Most women will put up with a little smoke and lack of ventilation rather than have their kitchen torn up with installing the unit and putting up ducts or providing proper wall openings. Thus sales missed at this time are probably lost forever. Kitchen exhaust fans designed to harmonize with any kitchen will be in stock and on display.

Complete information and stocks of heat lamps, sun-lamps, and ultra-violet germicidal lamps will be on display. Uses for home and farm will be thoroughly explained and demonstrated.

Another orphan of the appliance dealer is the electric clock. Here again variety will be the turning factor in sales because Mr. Johnston will stock several sizes and styles and expects to have at least one on display of a reproduction of a large grandfather clock.

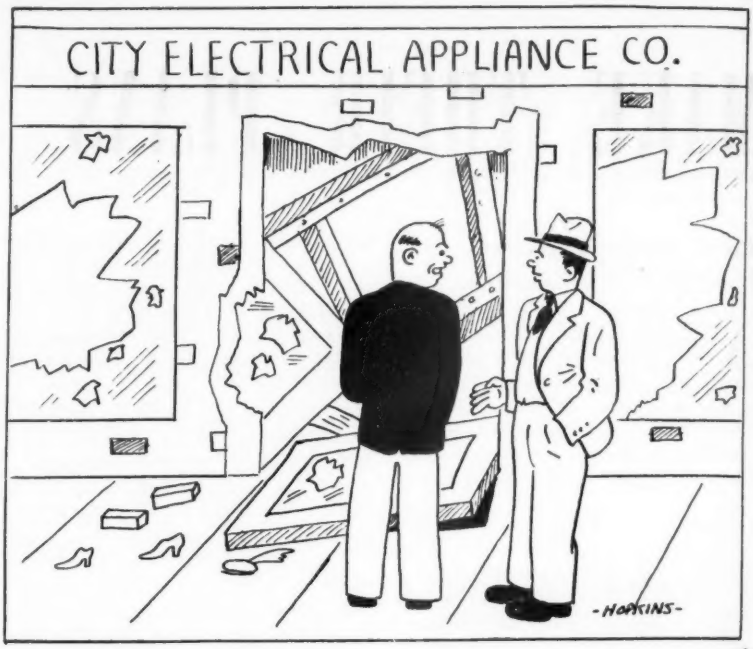
Under the system of such varied stock of electrical items, Mr. Johnston expects to reap a small return at least from the well known sales theory that displaying means selling.

Many of the customers who will come into the store do not expect to buy a grandfather clock. They'll examine it first out of curiosity. Next, father and the boys will look at it, and mama will say she would like to have it but they can't afford it.

If they have the proper home for such an article, and that presupposes pride in it, and one of the family says, "Wouldn't this corner be a nice place for that grandfather clock at the Salem Hardware?" there is a good chance that father will say, "Let's get it!"

That's extra-dividend selling from allowing the customer to repeatedly come in contact with the merchandise.

Packaged room air conditioners will be scientifically merchandised by calling on the people who can use them best. In addition to regular home use, they are desirable for stores, hospitals, business offices, and schools.



"All I did was put a postwar model washing machine on display. The women did the rest!"

Consider automatic electric blankets. Displayed, they do not mean much to city or rural families. Not many people know what their advantages are. That's why Salem will stock them and then tell their prospects that they induce relaxed and restful sleep. Those who have trouble sleeping, who take sleeping powders, or who count sheep until the wee small hours are at once interested. These blankets furnish uniform warmth all night and do not tire the sleeper from excessive weight. They can be used to preheat the bed before retiring. This information interests a lot of other people, and merchandise that is interesting, sells.

Kitchens, Laundries—Major Items

Mr. Johnston sold several electric kitchens, before the war, from his electrical appliance department and has sold many major items for several years. He will continue to sell complete kitchens, steel kitchen cabinets, and other kitchen furniture.

A complete laundry will be a major item. Washing machines of several types, flat-plate and roll type ironers, a tumbler clothes dryer, and an automatic washer will be displayed.

Here are some of the sales figures to be used in selling laundry appliances. A survey shows that the family that does its own laundry saves $4.00 a week or over $200 a year. Most home owners are interested and most of them have 20-year mortgages on their homes. A home laundry will save them more than $2000 over the 20-year period they are paying for their home—certainly a good investment.

Home freezers, small and large electric refrigerators, two-temperature refrigerators, and most any combination wanted for city or farm home will be available.

A special farm section of the appliance store will contain special equipment for the farmer. This stock will consist of electric brooders, soil heaters, motors, water warmers for stock, cream separators, utensil sterilizers, water systems, yard lights, electric sink, oil burner equipment, soldering irons, and trouble lights.

In addition, there will be provided kitchen plans, house plans, remodeling plans for farm home or city home, all designed to incorporate the latest electrical appliances. Salesmen will be educated in the uses and desirability of all the displayed merchandise, and some form of competition for salesmen will be used as an incentive for more sales production.

The entire front of the store is being remodeled for the display of appliances, and demonstration and display rooms will be provided on the second floor.

A mailing list containing the names of all the electric current users in

city and rural areas in his territory is being screened now for prospects by sending out a letter to each name. The letter contains an ordinary government postal card which they are asked to return with their correct address and the company agrees to mail them notice of the arrival of new electric merchandise. If they wish, they are asked to write the name of any appliance they especially desire at this time.

This will insure a fresh and up-to-date mailing list, plus a few hundred customers who are ready to buy on receipt of a card or a telephone call.

Second year's advertising will be based on the volume done the first year and the first year's promotion will also use radio.

House-to-House Salesmen Already on the Job

FIVE house-to-house salesmen in the field, one a returned war veteran, selling sewing machines, paint, and oil heating equipment, is the record of the Wythe Appliance Co., Inc., 2210 Kecougtan Road, Hampton, Virginia.

"We have a large stock of rebuilt electric sewing machines and the agency for the White when new ones are released, and we have men out knocking on doors to sell them," Earle H. Aleck, secretary and treasurer of the firm said.

"Since we can't stock our full lines of electric ranges, washers, and refrigerators, we thought it would be good business to build up a sales force and sell what we have. We have a line of paint which the salesmen sell as they go along. They also take orders for electric appliances which we expect to have on the floor soon," Mr. Aleck said.

Wythe Appliance Company is located almost half-way between Hampton and Newport News, Va., and have ample parking space for customers. The street is a through highway and carries heavy traffic but the store is not located in a downtown section. It was established in December, 1944.

Mr. Aleck said their sales approach will be one hundred per cent house-to-house. The way to sell merchandise is to take it to the people and meet them face to face and talk it out, according to Mr. Aleck, who said the large sales floor will be used to sell any drop-in customers that may come in, but probably will be mostly used to show customers that are brought in by house-to-house salesmen.

Another angle to getting a crew of house-to-house salesmen together right now is that they can be found and, as a general rule, they are not working because there has been no direct selling of this kind since long before the war.

Many returned veterans have had direct selling experience. Mr. Aleck said all their salesmen were experienced in their line.

"Customers are glad to see a salesman, right now, when he rings the doorbell," Mr. Aleck said, "and are glad to listen to what he has to sell and what it will do for them."

Production Equipment Meets Farmers' Needs

CULTIVATION of the electric-service-connected farm market, which is power and labor-saving minded, will develop one of the biggest and best markets for the electric appliance dealer in rural areas, according to F. M. Williams, owner of the Williams Air Conditioning Company, Petersburg, Virginia.

His plan for the future will be to continue development of the rural market around Petersburg, which he started several years ago, and to take care of the city business at the same time.

Nearly every farmer in the area has electric service and although all of the farming operations might not be called large, all of them are profitable.

Farmers know just as much about what is going on as city folk do and read the same advertisements, Mr. Williams said, and to sell this market, the appliance dealer needs to know the farmer's problems so he can discuss them intelligently.

The progressive and prosperous farmer is a business man who is in

F. M. Williams, owner of Williams Air Conditioning Co., of Petersburg, Va., showing one of the large refrigerators he has been selling to farmers. Below, exterior of the salesroom.

Roadside store of Wythe Appliance Company, halfway between Hampton anad Newport News, Virginia. This company is developing a hard-hitting sales staff and will concentrate on house-to-house promotion.

A line of wood and steel cabinet equipment is in demand by both city dwellers and farmers in the territory served by the Williams Air Conditioning Company, of Petersburg, Virginia.

the market for commercial-size electric refrigerators so he can kill a hog or a beef and refrigerate the meat. He will be one of the country's best customers for frozen food units. He is buying germicidal lamp banks, electric hay driers and electric heating devices that make seedling peach trees sprout faster. He is far in advance of the average city dweller in the use of electric devices because he uses them to make his farming operation more efficient and profitable. His use of appliances is on a par with the average industrial concern, and he wants thermostatic controls for his motors, and germ-killing devices in his poultry houses.

Once the farmers find out that you are studying their problems and helping them to get the most out of the use of electric power, new business will develop in a logical and satisfactory manner, Mr. Williams said, but on the other side of the fence, when they find out that you don't know the applications and the uses of the devices they inquire about, they probably won't bother to call the second time.

Mr. Williams has practically set up a department to take care of the farmer. Large commercial-size electric refrigerators are sold in increasing numbers.

Germicidal lamp equipment promises to be a boon to farmers, according to Mr. Williams. In one egg hatchery with a million-egg capacity a regular 27 per cent expected loss was reduced to 5 per cent by the use of germicidal lights on the eggs in the incubators which killed bacteria and germs before the chickens were hatched.

Electric hay drying equipment was developed in Virginia and makes the farmer further independent of the weather by making it possible for him to cure his green hay in his own barn.

The coming era will see air conditioned farm homes and in some cases electrically-heated farm homes, according to Mr. Williams, who keeps in close touch with the farmer.

While the accent has been on canning and there has been a widespread dissatisfaction with home dehydrating, Mr. Williams is sure there will be an increase of dehydration on the farm.

"Mistakes in dehydration have been made because of dehydrating products that taste much better when canned," Mr. Williams said. "In my territory, I know that there will be a big demand for dehydration equipment because my farmer-customers are going to dry their beans, apples and peaches, as well as can them."

Mr. Williams has been in the electrical appliance business since 1929 and formed his present company in 1940.

"There has been a lot said about educating the farmer to the use of electric power," Mr. Williams said, "but the appliance dealer had better learn the farmer's needs or he'll find the farmer is educating the appliance dealer."

Rural Electrification Stride

Fewer than 100,000 farms were electrified prior to 1930. The total today is 2,600,000, with plans under way for the extension of lines to a million more in the next 3 years.

Face Lifting for Store Is Good Starting Point

TO DRAW up plans for the second expansion before the paint is dry on the first remodeling is unique in the annals of merchandising.

But that is what Jones & Gooding, appliance dealers at 3150 Cary Street, Richmond, Va., have done, and it is going to make a big difference when the appliance business enters into the stiff competition that is expected when merchandise is released.

Even though they have leased a location a few doors from their present one which will give them more than 150 feet of glass window display, Jones & Gooding have just completed remodeling their present building so that the customers and prospective customers will not get the idea that just because they are going to a new and larger building and have to wait for the release of materials that they are letting down on their merchandising job or their service.

The face-lifting operation on their old store as a prelude to their new and larger operation has already brought much attention to their post-war plans and elicited much favorable comment from customers. It has also increased sales in all the things they now have to sell.

"Whenever a store decides to move to a better location, it always begins to take on a rundown appearance," Mr. Jones said, "and this usually causes some loss of business. Since we had no idea how long it will take for us to get moved and what delays may obstruct the operation, we decided to remodel and renovate our present location as a preliminary to the new home. It has already paid excellent dividends and tells the customers in more ways than one that we are in business to stay."

Their present location was repainted. New round cornered display tables were located which could be used in the new location and were installed. Attractive signs were painted and placed on the walls informing the customers of the things to come in electric appliances.

Table and floor lamps were stocked for display as well as other available merchandise such as germicidal lights and sunlamps.

Prospect lists were compiled and all visitors were tabulated and listed for whatever item they expect to buy when equipment is available.

Their present location is in a neighborhood shopping area flanked by chain variety and food stores, all of which are in an offset from the street

Round-cornered display tables for small appliances are used to good advantage by Jones and Gooding Appliance Company, of Richmond, Va. Right now the tables are used mostly for lamps and antiques as shown at top. In center above, Mr. Gooding, left, and Mr. Jones discuss plans for the second expansion of their company. It was undertaken before the paint was barely dry on their first postwar expansion project. The exterior of the store is shown directly above. At right is a general view of the small appliance display. The company has been in business for eight years. While there was no merchandise to sell, they specialized in courteous, reliable appliance service.

which provides off-the-street parking in front of the store.

Their new location will be in a larger building at the end of the offset with the same advantages and full glass display windows on the side and front measuring about 150 feet.

Their next building is already under lease and is being remodeled and used as a warehouse at the same time.

One of the features of the new building will be a full electric kitchen display with seating capacity for conducting a cooking school.

Those attending the cooking school will be exposed to all the merchandise display on the sales floors. Private cooking demonstrations produce the best type of prospects, according to Mr. Jones.

Jones & Gooding have several different lines, but expect to specialize on automatic washers.

"Automatic washers will be much in demand when they are available," Mr. Jones said, "because most of the laundries have fallen down on the job during the war and the domestic help has all left. The wise housewife, rather than return to the old way, will investigate the advantages of the automatic washer, and once she is acquainted with what it will do, she will buy one. Each sale will represent a unit sale of about $200."

Jones & Gooding have been in the appliance business for eight years and during the time when there was no merchandise to sell have been devoting their efforts to giving good service on outstanding appliances.

They were one of the few firms giving 24-hour service and were able to do this without actually staying up all night by engaging the services of a central telephone exchange which takes the calls and locates one of the service men.

A large and well equipped service shop will be a feature of the new location, Mr. Jones said. This shop will be located out of view of the public but they will repair all small appliances in a small shop under the mezzanine in the new store. This will be a show shop and work will be done in full view of the public and some service will be rendered while the customer waits.

The food stores in this shopping area remain open on Friday and Saturday nights and the new appliance store will remain open the same hours.

This will be the time when the whole family comes to shop for groceries, but they will also be on the lookout for needed household equipment and Mr. Jones will be ready to answer their questions about electric appliances which they intend to buy.

Mr. Jones said that they expect many of their best deals for laundry equipment and electric kitchens to be closed on these evenings.

Mr. Jones also said that they had been more fortunate than some through the trying days of the war because thay had been able to hold most of their help. They provide incentive bonuses for their employees and also have a lake property equipped with cabins which is for the use of any or all of their employees any time they have an opportunity to go.

"They do not have to ask someone or make reservations," Mr. Jones said. "There are facilities for all and any time any of them can get away to go, they just go. They like it this way."

"We have never docked for off time and we always pay for vacations," Mr. Jones continued. "For that reason, we have been able to keep most of our old help. There is no substitute for loyal and experienced employees."

For promotion of electric kitchens

(Continued on page 76)

"WAR BABY" MAKES GOOD

Industrial maintenance and repair work for industrials leads to good volume of construction contracts.

MOST electrical shops beset by shortages have been content to simply "hang on" for the duration. It's been no easy job, either, in many instances. That makes it all the more amazing in the case of the Industrial Electric & Supply Co., Inc., Memphis, Tenn., "war baby," which is really going places in a hurry.

What's the secret of this unusual success?

For Industrial Electric & Supply—a real "live wire" organization—it's a formula with lots of amperage.

Three experts, who formed the company at Front and Auction Streets early this year, have the necessary experience and reputation to pull business from MidSouth industry. They have been going after the business—and getting it.

Jack W. Hunt, the president and general manager, is widely known in the field of repair, maintenance and industrial power installations, as are the other officers of the firm. Hunt has had a total of 16 years' experience —has held every position from stock boy to executive, and has achieved a national reputation as an industrial power construction and application engineer. A number of the South's largest industrial plants have been electrified under his supervision.

John V. Egle, vice-president, has been in the electrical construction business 34 years and supervised the complete power and lighting systems in many of Memphis' large commercial buildings, manufacturing plants, hospitals, and pumping stations. He's the construction superintendent.

Secretary-treasurer and plant manager is Ralph W. Trobaugh, with 20 years' experience in motor repair and maintenance. He has held every position from the coil bench to design desk, has trained many of the young men from Memphis who now are doing technical work in the armed forces, and has redesigned many electrical machines to operate under conditions different from those for which they were intended, so that plants unable to get new machines could continue to operate efficiently.

But it takes more than expert personnel in these times. What about material? Where is it coming from? Let Hunt tell about that.

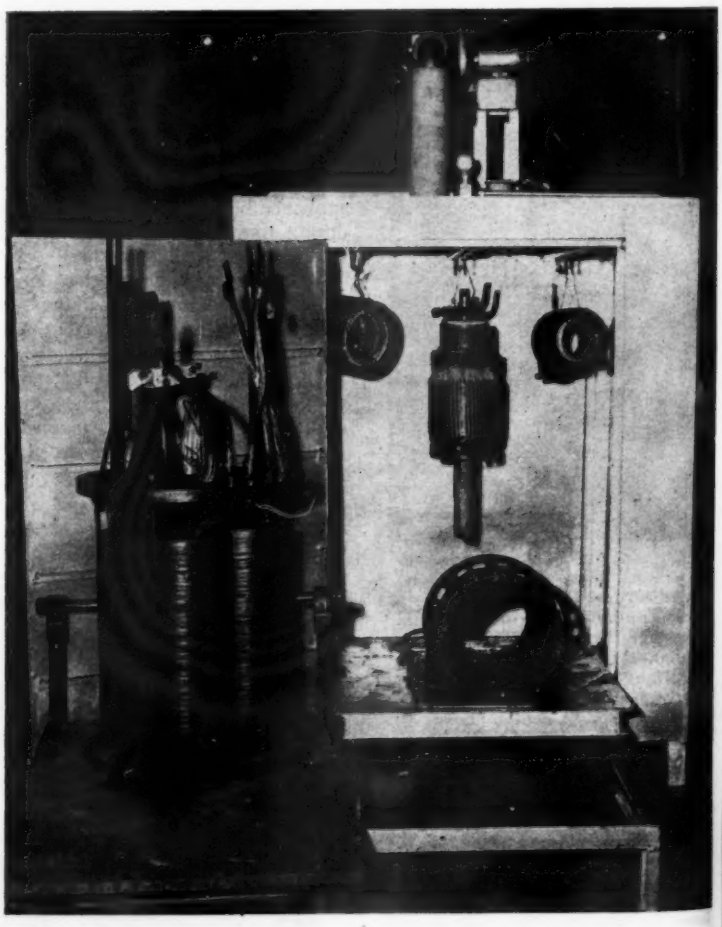
"Starting from scratch, we have gone after electrical material with our eyes open for anything and everything that we can use in repair work. In order to have materials, as well as motor and control equipment, we have fairly scoured the country, buying up any surplus obtainable in the East and West.

"We were successful in purchasing some material from completed construction jobs, particularly a large quantity of weatherproof copper wire and special underground cable not available on the regular market these days. This wire and cable, in good condition, will give many years of service.

"These purchases have enabled us to build up a supply that is helping to keep MidSouth industry humming."

The proof is apparent for all to see, too. For example, the company's first month of operation in its unusually well adapted building, the force of 12 experienced electricians was kept busy by repair orders while the firm purchased and resold more than 5000 horsepower in motors of all types. The trend has continued through succeeding months.

Industrial Electric & Supply is giving particular attention to maintenance and repair work for gins, saw



Industrial Electric and Supply Co., of Memphis, is particularly proud of this electrically operated oven for baking synthetic varnishes. It was constructed by Mr. Trobaugh, plant manager.

Above, general view of the machine shop. At right, Mr. Trobaugh checks new motors that have just been sold.

mills, oil mills, ice plants and other such concerns. In addition, it is accepting contracts for wiring construction and installations for public utilities, switchboards, and power panels.

The company is handling V-belts and sheaves and represents the Fort Worth Steel & Machine Co. It is carrying a complete line of repair parts, bearings, etc. for all makes of electrical equipment.

By picking employees already known to many customers — employees who sought the opportunity to join the new concern—and with experienced men in charge, the company is able to speed service. It is subject to call at any hour, day or night. The company expects to expand and already is making plans to train men coming back from the armed forces seeking electrical work.

The company's plant floor arrangement is one reason it is able to expedite service work. The floor arrangement is just what most electrical shop men appreciate most. It's no helter-skelter thing, but well planned.

The shop occupies 5000 square feet on one floor—is well lighted and ventilated. "We made a special effort to wire the building with plenty of lights and intend to put in fluorescent lighting," Hunt explains. "We are carrying out color schemes easy on the eye, too."

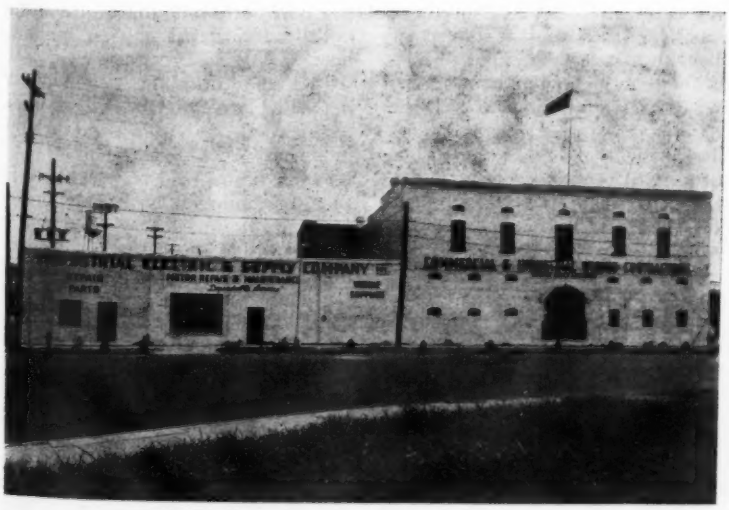
Completely equipped with machine tools for light machine work, including power-operated coil forming and testing equipment, the company offers a complete service.

But Industrial Electric & Supply's pride is its specially designed oven—the work of Trobaugh. With the baking of electrical equipment determining to a great extent the life of a machine, Industrial Electric & Supply spared no expense in constructing an oven of the most modern type—electrically operated. It's designed especially for the baking of new synthetic varnishes with control and forced air ventilation.

The shop is well planned. Machinery was layed out on blueprint before it was ever put on the floor. Everything was designed to save labor and time on the job. The company has plenty of parking space, electric loading and unloading devices, and is served by a railroad spur track. An overhead trolley system and floor hoists facilitate handling of heavy units.

Located just eight blocks from downtown, the shop is convenient to the heavily industrialized North Memphis section. It has a three-story adjoining building with 15,000 square feet of floor space for storage.

The company is anticipating the



Exterior of Industrial Electric's modern building in Memphis.

Here are officers of the Industrial Electric and Supply Co., of Memphis, electrical contracting organization that has grown in spite of wartime conditions. Left to right are Ralaph W. Trobaugh, secretary-treasurer and plant manager; Jack W. Hunt, president and general manager; and John V. Egle, vice-president and construction superintendent.

postwar era with big things in mind. It is going to have an engineering organization for planned wiring installations to take care of power requirements for the major industrial plants in Memphis and the MidSouth.

"With Northern industry heading South, shops such as the Industrial Electric & Supply Co. which are able to provide all-around service will be very much in demand," Hunt believes. And he's ready, too.

"Already the transition from Diesel and steam to cheap TVA power in the Memphis area is being felt," he explains. "Industrial plants, gins and oil mills are converting to dependable electricity. We'll be helping to speed the change."

So, while some electrical shops are fretting about shortages in general, at least one Memphis plant is up to its neck in work and building a reputation that will be felt by rivals in the lush postwar era.

Industrial Power Sales A Key to Postwar Jobs

INDUSTRIAL power sales provide one of the keys to more jobs and a higher level of community prosperity after the war, it is declared in a survey of industrial power markets of the country by the Commercial Planning Committee of the Edison Electric Institute. The survey, covering the major industrial power markets, is the work of power company executives representing nearly every section of the country.

"Full recognition," the report states, "is given to the need for a high level of industrial activity if we are to maintain employment, purchasing power, and avoid a lasting depression which will seriously affect the residential and commercial consumption of electricity."

"Thus," the survey declares, "power salesmen must be ready to work with industry in their areas to improve efficiency in order that costs may be cut and more products sold at lower prices. Increased sales at lower costs will in turn unlock the door to more jobs, more residential and commercial sales of electricity, and to a higher level of community prosperity."

Emphasizing that the electric industry has never recognized a limit to its growth, the report sees postwar gains ahead as the result of new inventions, new applications of electricity, and improved methods of producing goods in greater quantity at lower cost, even though competition from other sources of energy may be severe in certain fields of application. It takes up in detail the prospects for the use of power in such industries as steel, chemicals, foods and mining.

The Edison Electric Institute publication cites a pent-up demand for 12,000,000 automobiles, a postwar market for five to 10 million homes, and heavy demands for steel in reconversion and highway construction, indicating that the steel mills should be one of the best postwar customers for electric power. Railroads are declared to need three or four million tons of steel rails alone. On farms, a half million trucks need replacing.

Steel already uses 16 per cent of all power sold by utilities for industrial purposes, and since the peacetime use of new high alloy steels will probably expand, the electric arc furnace should be used for more and more of the output.

In chemicals, large volumes of energy will go for the manufacture of chlorine, chlorine derivatives, and caustic soda which find a wide variety of applications in the manufacture of soap, petroleum products, rayon and other textiles, rubber, pulp and paper, plastics, high-test gasoline, sulpha drugs, dyes, and waterproofing materials.

It is pointed out that dielectric heating (heating by passing high frequency current through a material) has become an essential production method in numerous industries. It is used in the manufacture of plywood and plastics, for the drying of penicillin, and it may take on the role of destroying bacteria and weevils in cereals after packaging.

In the paper industry, the electric companies will stand to benefit from the manufacture of war-developed products of a number of kinds. The paper industry has always been a large user of electric power and her dielectric heat treatment of plastic-impregnated paper may provide a means of replacing some metals.

The cement industry consumes much electric power. Cement, concrete products, tile, mineral wood, and wall board will all be in demand for the anticipated postwar building boom.

Important from the standpoint of purchased power is the use of infrared drying of pottery and related products.

A big future field for electricity in the glass industry is in the further mechanization of glass making and in its application to melting and annealing processes. The glass industry's two big markets are automobiles and construction. Designs for the future show that automobiles will employ more glass for better driving vision and that residential and commercial buildings will employ more glass for improving lighting.

Coal mines probably will supply a new postwar power market through the development of mechanized loading. Coal cleaning and processing

"GOOD SERVICE"

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will be another source of revenue when more coal goes to provide the raw materials for plastics, nylon and rayon. While it may be that the use of coal in the steel industry will decline, this will be compensated for by the electric companies using more coal to supply power to these steel mills.

The picture for postwar power use in the airplane and shipbuilding industries which have been so tremendously expanded during the war is not so bright. After the war, the airplane factories are expected to use not more than 15 or 20 per cent of the power they required in 1944, and the shipbuilding yards are expected to use not more than 10 or 15 per cent of their 1944 consumption.

Interesting Possibilities In New Type Conduit Clamp

DEVELOPMENT of a new type clamp, particularly adaptable for tube and conduit type installations of all kinds, has been announced by The Glenn L. Martin Company, Baltimore, Md. The development is another step forward in Martin's program to further ease of maintenance and simplicity of design in the planes which the company builds.

The clamp is shaped after an inverted lateral "s" and is fastened to the wall or frame with an ordinary screw. The tubing to be fastened is placed in the open side of the curve and the clamping ring passes around the back of the base, over the top of the tubing and down the front where it is hooked under the curve at the front of the "s" to form a simple locking device.

The clamping ring can be made of a high grade synthetic rubber or other elastic material. At the present time, the Martin plants are using standard hydraulic seal "o" rings which have been rejected for use as hydraulic seals because of improper tolerances. The rubber ring also serves as a "shock absorber" in eliminating vibration. If it is damaged and necessitates replacement, this can be accomplished without removing the clamp body.

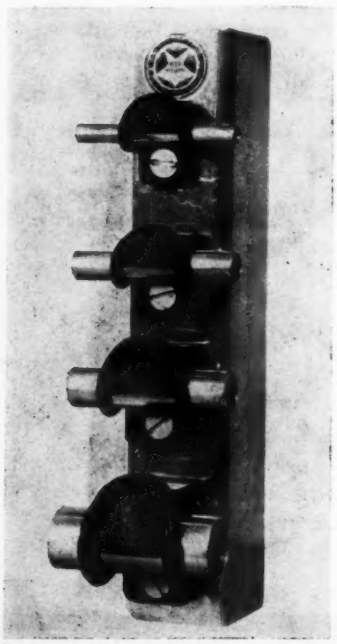
The clamp proper can be moulded from a fabric base phenol fiber material or fabricated from formed sheet metal in any desired size. The combination results in a clamp which is extremely durable, yet light in weight and attractive.

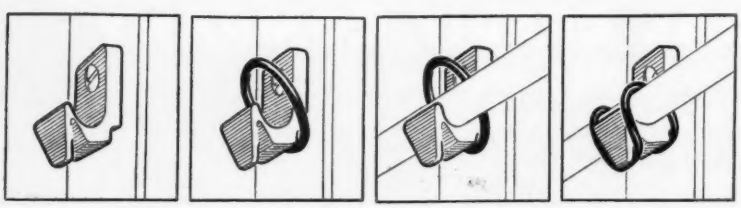
Now being used in plane installations for fastening hydraulic and pneumatic tubing, wire bundles and electrical conduits, the bodies are moulded in color to follow individual hydraulic or electrical runs.

The clamp is an answer to the "mechanics prayer" for in addition to needing no tools for installation or removal of objects, the clamps afford other conveniences. There are no loose parts to be lost or broken, and when the clamps are used in a series, any single tube or conduit can be removed without disturbing the others. The clamp also is readily adaptable for bonding.

Use of the clamp is in no way restricted to plane production and could be readily used for other purposes such as fastening plumbing in housing. This can be done by merely substituting a fiber-glass clamping ring to obtain the necessary durability for long periods of time.

Though the Martin Company has not started production in large quantities on the clamps at the present time, this work will get under way soon either through their own facilities or those of a licensed organization.



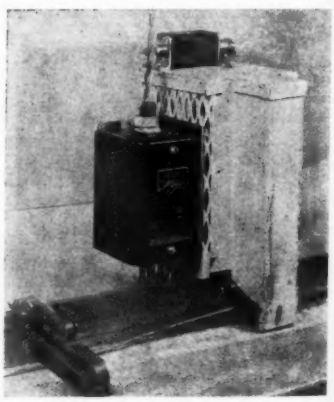


The new type of conduit clamp illustrated here was developed for use in bombers but it may have many interesting postwar uses. At left is a group of clamps of different sizes in actual use. Below is a step-by-step diagram showing how conduit is fastened to hanger with rubber ring. Other materials, such as fiber-glass, could be used for the fastening ring in order to obtain the necessary durability for long periods of time.

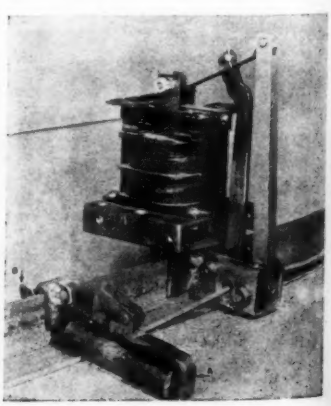
Electric Cable Cutter Minimizes Cutting Time

AN ELECTRIC cable cutter, designed and developed at General Electric's Pittsfield Works, is used to minimize the cutting time of wire for control-panel cable assemblies. Easy to make, the unit consists of a push-button-operated, 110-volt solenoid, a cutter enclosed in metal hous-

(*Continued on page 75*)



Wire cutter with and without cover.



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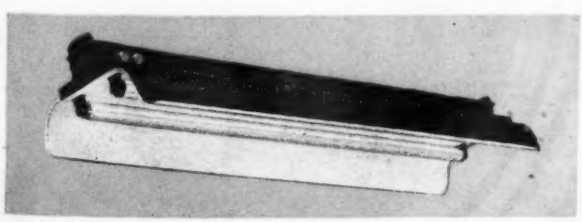

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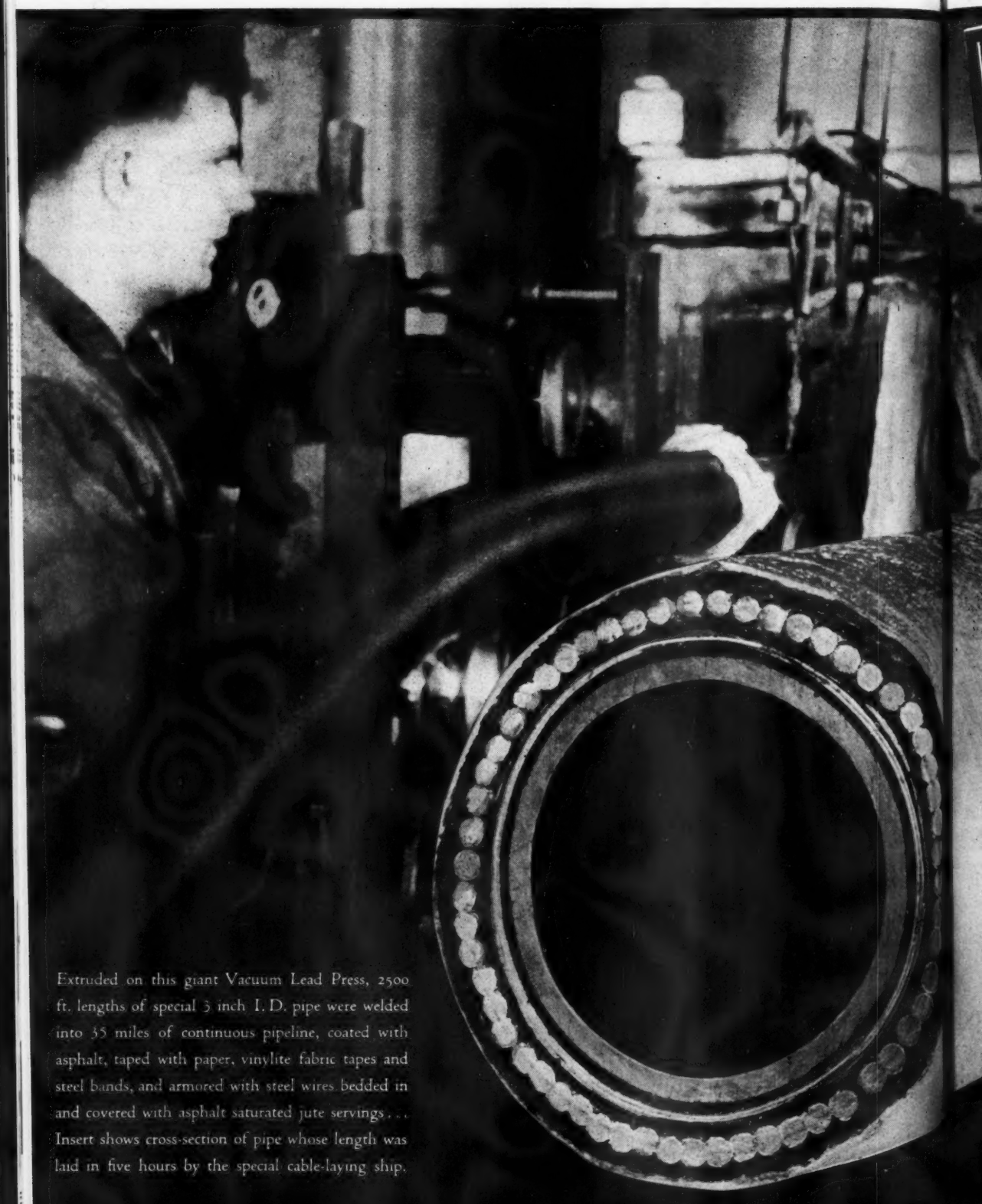
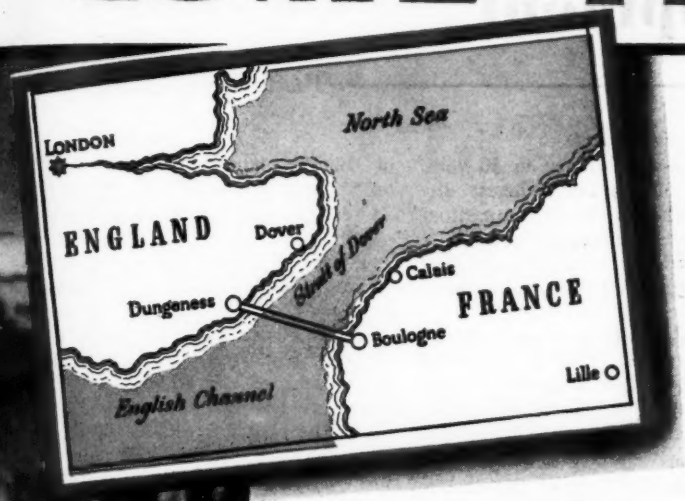
A PIPE DREAM



Extruded on this giant Vacuum Lead Press, 2500 ft. lengths of special 5 inch I. D. pipe were welded into 35 miles of continuous pipeline, coated with asphalt, taped with paper, vinylite fabric tapes and steel bands, and armored with steel wires bedded in and covered with asphalt saturated jute servings . . . Insert shows cross-section of pipe whose length was laid in five hours by the special cable-laying ship.

COME TRUE . . .



With the active interest of General Eisenhower, and Allied officers, Admiral Lord Louis Mountbatten conceived a series of pipelines under the English Channel to feed precious oil and gasoline to Allied fighting forces speeding across France, Belgium, Luxembourg and Germany.

Experience in making the largest submarine electric-power cables enabled General Cable to volunteer undertaking its part of this important contract with its own existing facilities. General Cable quickly started making this continuous 35-mile pipe, thanks to available equipment commandeered from its coast-to-coast plants, its wealth of research and engineering talent, plus dogged determination to speed Victory. In about nine months from installation, the under sea traffic fuel from England to the continent via channel pipelines had totalled 120,000,000 gallons, freeing oil tankers, cars and other transport for more vital duties. With public recording of this secret comes the buoyant feeling that dreams do come true and many more, as yet unrevealed, will foster progress in a peace we all can share.

GENERAL CABLE CORPORATION

General Cable Corporation Sales Offices are located at Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Kansas City (Mo.), Los Angeles, New York, Philadelphia, Pittsburgh, Rome (N.Y.), St. Louis, San Francisco, Seattle, Washington (D. C.)

Maintaining Industrial Electrical Equipment

Part 7—Capacitors*

THE MAINTENANCE required on power-factor-improvement capacitor installations is so small that its importance is often overlooked entirely. The first inspection of operating voltage and temperature should be made 8 to 24 hours after energizing the capacitor bank. The voltage of the system near the capacitor location should be checked during the first light-load period to ascertain whether overvoltage is present. Any changes in circuit connections, which may increase voltage levels, warrant a re-check of operating conditions.

A regular inspection should be made four times a year or oftener, depending upon the severity of operating conditions, giving attention to operating voltage, temperature, fuses, and possible mechanical damage. Capacitor bushings and busbar supports, subject to accumulation of dust or foreign materials, should be cleaned periodically, the intervals depending on the severity of dust conditions.

Discharging Capacitors

Because of their extremely high internal resistance, capacitors may retain a charge for days after they are disconnected from the circuit, if no discharge circuit is provided. Most power-factor-improvement capacitor units have internal resistors connected directly between their terminals to automatically discharge the capacitor. Separate discharge coils are sometimes used with large banks. However, before touching any terminal or bus connection, it is recommended that the capacitor be disconnected from the circuit and then discharged by short circuiting the terminals and, at the same time, temporarily grounding them to the case or supporting rack. A T-shaped conductor insulated by a stick of wood provides a convenient and safe means of discharging a capacitor unit.

For capacitors installed in industrial plants, the National Electrical Code requires that the discharge device reduce the residual charge to 50 volts or less in one minute, whereas discharge resistors in pole-type capacitors for electric-service companies, not covered by the Code, usually are designed to discharge to 50 volts in five minutes.

Potential transformers may serve as discharge devices, but, if connected through fuses, the fuses must be capable of carrying the discharge current without melting.

Capacitors supply reactive current through the reactance of the circuit. Thus the operating voltage at the point of the capacitor installation is increased. Therefore, capacitors are more likely to operate on overvoltage than other equipments which absorb or require reactive current and cause a voltage drop in the line.

Recognizing this factor, the voltage rating and permissible operating overvoltage of capacitors are higher than those established for some other devices, such as induction motors. Standards have been established to permit 10-per-cent overvoltage for short periods on capacitors rated 2400 volts and above, and to permit 15 per cent temporary overvoltage for ratings of 230, 460, and 575 volts. Permissible overvoltage, as an average over any 24-hour period, is 5 per cent for all ratings.

The average operating voltages are subject to the limitation that the maximum permissible operating kva, which may include harmonic kva, must not exceed 135 per cent of the kva rating. If the average voltage over any 24-hour period is more than 5 per cent above the capacitor rating, then (1) the circuit voltage should be reduced, (2) the capacitors should be switched during the high-voltage period, or (3) capacitors with higher ratings should be used.

Continuous operation at the upper voltage and temperature limits will shorten the life of the capacitors, and such operation should be permitted only in cases of emergency. The phase voltages should be balanced and kept within the voltage limits given above.

High alternating-voltage transients are uncommon in most circuits, but may be encountered. For instance, they may be caused by switching, by open-conductor, or line - to - ground faults. Where such overvoltages are

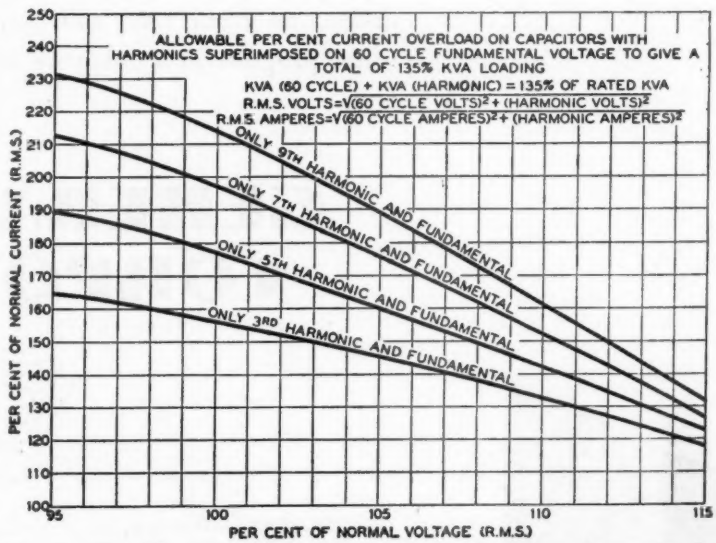


Fig. 1. Allowable per cent overload current with various harmonics for measured capacitor voltages.

*This article is adapted from information prepared by engineers of the General Electric Company.

Let's cross these rivers before we come to 'em!

RIVER development and flood control rank high on the list of America's post-war plans. Many of these projects call for dams which may also produce electric power.

This involves issues that should be discussed and settled now—*rivers to cross in advance.*

Many of us in the power business have had a long experience with riverside plants, in the production of both steam-generated and hydro-electric power. In fairness to all taxpayers and in the interest of the many million users of electricity, we think we ought to outline our convictions and suggestions on river development and flood control.

1 When a dam is proposed, all of its purposes should be clearly defined in the legislation — flood control, navigation, irrigation or power. And just as clearly, the benefit to the people affected should justify the cost.

2 If power is produced at government-built dams, it should be sold to existing power systems, without special privilege or discrimination. This will save the expensive duplication of transmission facilities, help to co-ordinate the entire power supply of each region, and assure its widest possible use at the lowest practical rates.

3 Any savings made possible by this plan should be passed along to the users of electricity, under regulation by State Commissions or other properly constituted regulatory bodies. This will assure all the benefits of river development and hydro-power without the added expense of government going into business and competing with its own citizens.

4 Government in *any* business endangers *all* business. Government in business escapes many normal business obligations, enjoys free mail, pays no federal taxes, and few, if any, other taxes, little or no interest. If government can sell electricity on this basis, it can sell shoes, groceries, automobiles, or anything else the same way. Government may properly *regulate* business in the public interest but should not *operate* business. It should not play in the game for which it makes the rules. In other words, *government should not try to be umpire and pitcher at the same time!*

167 ELECTRIC LIGHT AND POWER COMPANIES*

** Names on request from this magazine.*

SELF-SUPPORTING, TAX-PAYING BUSINESSES

likely to exceed approximately twice the capacitor voltage rating, corrective measures should be taken.

The operating kva, including the sum of the fundamental frequency kva and any harmonic frequency kva which may be present, should not exceed 135 per cent of the rated kva. The reference curves in Fig. 1 show the allowable per cent overload current with various harmonics for measured capacitor voltages. Although more than one harmonic can be present, one usually will predominate, and a reasonable estimate of capacitor loading will be obtained by using the fundamental and one predominant harmonic in connection with the curves.

To determine whether harmonic overload currents are present, capacitor voltage and current readings should be taken over a sufficiently long period to include the minimum-load condition on the circuit. Recording instruments are preferable, but frequent readings of indicating instruments are usually satisfactory. If high current occurs due to voltage other than the fundamental, the capacitor may be in partial resonance with a harmonic in the circuit.

During such a high-current period, the values of current should be obtained for various numbers of capacitor units connected to the circuit. The number of capacitors connected may be changed by removing fuses or by switching sections of large banks. The product of capacitor current and voltage compared with capacitor rated kva will reveal any condition of excessive harmonic current. If harmonic currents are above allowable limits, the condition should be corrected. Some possible methods are:

(1) Relocation of part, or all, of the capacitors to other parts of the circuit may reduce overcurrent due to partial resonance. The electrical constants may vary sufficiently in another branch of the circuit to prevent the resonant conditions.

(2) Capacitors may be switched off the circuit during periods in which overcurrents are likely to occur. It is possible to provide automatic control, actuated by a change in current, voltage, or reactive kva, or by a time switch.

(3) Over-excitation of transformers should be avoided, as this may cause excessive harmonic currents.

If the trouble cannot be corrected by these methods, it may be necessary to install a reactor of selected rating, connected either in series or shunt with all, or part, of the capacitor bank to reduce the harmonic current. Detailed information on the exact circuit conditions is required in order to determine the characteristics of the reactor required.

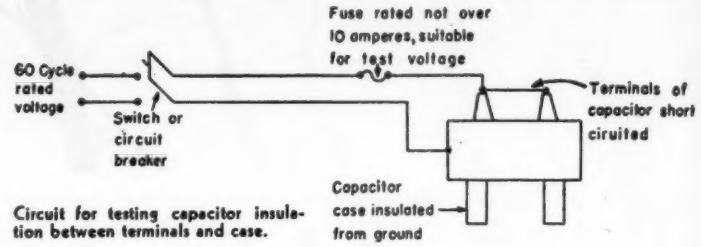


Fig. 2.

Operating Temperatures

The operating temperatures at the sides of the individual capacitor units provide a rough check on the operating voltage and kva. As a general rule, if the side of a capacitor unit is operating at a temperature above 55 C (a temperature too high to permit leaving a bare hand in contact with the surface), then a more complete investigation of operating conditions should be made. The case temperature should never be allowed to exceed 65 C.

Since the losses in capacitors are very low (not exceeding 1/3 of 1 per cent, or 3.3 watts per kva), the fact that temperature is one of the most important factors affecting capacitor life is easily overlooked. The temperature rise of capacitors must be kept lower than for many other types of apparatus, for the following reasons:

(1) Capacitors are necessarily designed to operate at comparatively high dielectric stresses. Therefore, operation at excessive temperatures for extended periods of time may result in a gradual deterioration of the dielectric, and a corresponding increase in losses.

(2) Unless switched off periodically, capacitors operate with a continuous temperature rise, varying as the square of the voltage applied. Therefore, capacitors are not subject to the usual load-cycle characteristic of most other electric devices.

Capacitor Fuses

Each capacitor unit or small group of capacitors is usually connected to the power source through a suitable fuse. Under normal conditions, the fuse rating should be from 165 to 235 per cent of the capacitor current at rated voltage and kva. Fuse ratings below 235 per cent are preferable, as they provide a better indication of an abnormal overload on the capacitor.

Installations should be checked four times a year or oftener for blown fuses. When re-fusing capacitors, use only fuses recommended by the manufacturer, as the fuse should have the proper voltage and current ratings, and be properly connected to serve the following purposes:

(1) If there is a fault in a capacitor, the fuse should isolate and indicate the faulty capacitor, and should do this without tripping other overload protective devices or interrupting service continuity.

(2) The fuse should quickly disconnect a short-circuited capacitor from the circuit to prevent damage to adjacent capacitors or other apparatus. Excessive internal gas pressure, caused by arcing, may rupture the capacitor case if the fault is not cleared in a limited time.

(3) A blown fuse frequently in-

(*Continued on page 74*)

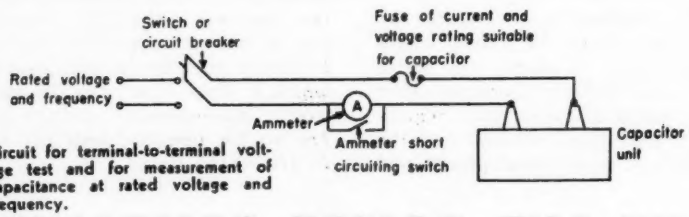


Fig. 3.

NATIONAL ELECTRIC PRODUCTS

WIRING SYSTEMS 6

WIRES AND CABLES

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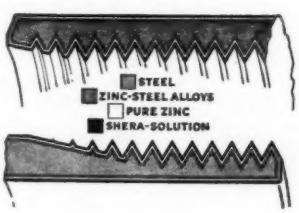
A RIGID STEEL CONDUIT

worthy of your finest buildings

NATIONAL ELECTRIC SHERARDUCT

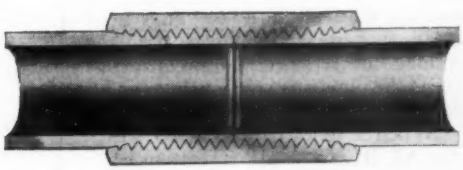
- IS MORE HIGHLY RESISTANT TO MOISTURE AND CORROSIVES.
- BENDS MORE READILY.
- FABRICATES INTO THE JOB EASIER.
- "LASTS AS LONG AS THE JOB."



Cross-section of Sherarduct

NE Sherarduct is a rigid steel electrical conduit that is worthy of the finest buildings. National Electric pioneered "Sherardizing" over thirty years ago. This process, by which zinc dust is driven into steel pipe and applied to the surface under heat, is unsurpassed for protection against rust and corrosion.

Even deposit of the zinc gives a uniformly protected, smooth surface over which is applied Shera-solution which impregnates the zinc. In addition, the steel is "Spellerized" to produce a pipe which works more smoothly, bends easier and threads cleaner.



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Wave Windings for A-C Motors

Chapter 3—The Series of Coils; Back and Front Pitch; and Slots-per-Pole-per-Phase.

By A. C. Roe*

This is a continuation of the series of articles, which started in the June 1945 issue of Electrical South, covering a complete study of a-c wave windings. This series will include a complete set of connecting diagrams developed on a new, simplified basis which eliminates the use of the large detailed drawings heretofore associated with wave windings. New subscribers can obtain copies of the first articles by writing to the editor of this publication.

THE BASIC wave winding is composed of two series of coils for each phase. The number of coils in each series is equal to one-half the number of poles, and to this extent the a-c wave winding is similar to the d-c armature wave winding. Typical series of coils for a-c wave windings are shown in Figs. 8 and 9.

The series of coils in Fig. 8 is for a four-pole winding, left-hand coils, leads on bottom. In tracing out the series, we start at A1, and progress in a counterclockwise direction through two coils marked a1 and a2 and end on the top coil lead R1. Figure 9 shows the series of two, three, four and five coils passed through on a four, six, eight, and ten pole winding.

The series of coils on a-c wave windings differ a great deal from those of the d-c wave windings in many respects. And for the true wave windings, as used in a-c three-phase rotor or stator windings, the d-c wave winding rules *do not* apply. The major rules of a-c wave winding series of coils will be discussed here and then explained in full detail later with instructions for constructing diagrams.

Each phase of an a-c wave winding will have two series of coils, one series between the A1 and R1 leads, as in Fig. 8, and the second between the A2 and R2 leads. The B phase series will be between the B1 and R3 and the B2 and R4 leads, and the C phase series between the C1 and R5 and the C2 and R6 leads. Thus the a-c wave windings will have a total number of series of coils equal to twice the number of phases times one-half the number of poles.

When a series of coils starts with the A1, B1, C1 leads on bottom coil leads, then that series will end with the R1, R3, R5 leads on top coil leads. The second series of each phase will start on the R2, R4, R6 leads on top coil leads, and end with the A2, B2, C2 leads on bottom coil leads.

When a series of coils starts with the A1, B1, C1 leads on top coil leads, then that series will end on the R1, R3, R5 leads on bottom coil leads. The second series of each phase will start on the R2, R4, R6 leads on bottom coil leads, and end on the A2, B2, C2 leads on top coil leads.

When there are more than two conductors per slot on the one-coil-per-slot-per-phase windings, then the number of series of coils is multiplied by half the number of conductors per slot. For example, on a four-pole, three-phase, two conductors per slot winding, there are two coils in series between the A1 and R1 leads, and a total of six series of coils. With four conductors per slot, there would be four coils in the series between the A1 and R1 leads, or a total of 12 series of coils.

With more than two conductors per slot, the winding will be encircled a number of times equal to one-half the number of conductors per slot. For example, on the four-pole, three-phase winding, two conductors per slot, the winding is encircled once between the A1 and R1 leads. With four conductors per slot, the winding is encircled twice between the A1 and R1 leads, etc. The winding will pass through *each slot* a number of times equal to one-half the number of conductors per slot.

The number of coils in the series of coils is affected also by the number of slots-per-pole-per-phase. For example, with one-slot-per-pole-per-phase, the number of coils in the series is equal to twice the number of phases times one-half the number of poles, which would be 12 for a four pole, 18 for a six pole, 24 for an eight pole winding, etc., or for each successive number of poles the number of coils in the series of coils increases in steps of six.

With two-slots-per-pole-per-phase or a larger number, the number of coils in series in the series of coils is increased by the direct multiple of the number of slots-per-pole-per-phase. For example, the four pole, one-slot-per-pole-per-phase winding has a total of 12 coils, 2 in each series; a four pole, two-slot-per-pole-per-

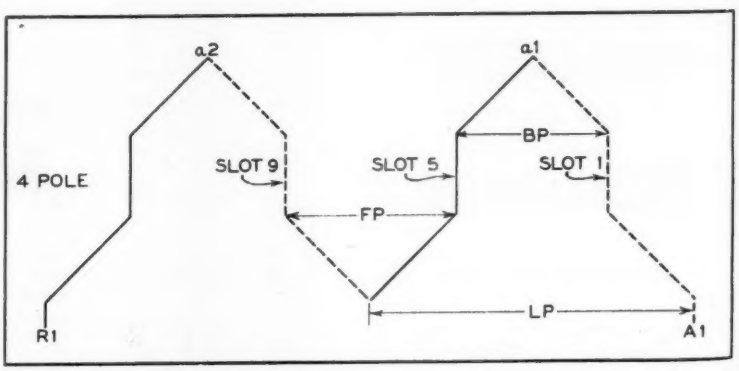

Fig. 8. The basic a-c wave winding is composed of two series of coils for each phase. Shown above is a typical series of coils. In this case there are only two coils in the series since this is for a four-pole winding having one slot-per-pole-per-phase and two conductors per slot. These coils are left hand, leads on bottom, counterclockwise. A1 and R1 indicate leads; a1 and a2 indicate coils; FP is front pitch, top to bottom across front end; BP is back pitch, bottom to top across rear end; and LP is the lead pitch which is equal to BP + FP.

In Production!

THE REFRIGERATORS BEST FOR YOUR BUSINESS!

Why the New G-E Refrigerators are geared to today's markets

Typical of the kind of refrigerator that's *most* in demand today is this 7-foot G-E de luxe model! (Independent surveys show this size is most wanted.) Packed with these popular features: Ample storage space for frozen foods inside "Super Freezer." Adjustable sliding shelf. Big 10.1-quart high-humidity drawer. 550 cu.-in. fresh meat compartment. (And its moderate *price* will be right, too!)

In the coming period of first retail refrigerator sales to civilians, probably *any* refrigerators could represent good sales opportunities for you.

But we are certain that these new *G-E* models are your *best* bet!

Not only because of the G-E name and reputation for reliable service—although the war has brought refrigerator *dependability* home to Americans more than ever before.

Not only because G. E. created the famous "sealed-in-steel" refrigerating unit that made possible "A million G-E Refrigerators in service ten years or longer." Not only because the *new* "sealed-in-steel" unit is finer, more compact, more efficient than ever before—built for still longer years of repair-free operation.

But largely because we have geared our production plans to *your* business. By concentrating on fewer *models*, we can turn out *more refrigerators for you to sell!*

Through independent surveys, we found out what sizes, what prices, are *right* for today's market. What features are most in demand!

In pursuing this policy, we are concentrating our *first* production on the 7-foot de luxe model described at left, plus a 7-foot *standard* model at an economy price. There will also be a limited number of 6-foot standard models.

These models are G-E *all the way through. And you can bank on this:*—G. E. is back producing refrigerators with the same "know how," the same engineering and factory personnel (all the wiser because of war production experience) that earned General Electric's reputation for making the finest refrigerators money can buy.

"THE REFRIGERATORS MOST PEOPLE WANT MOST"

GE Refrigerators

GENERAL ELECTRIC

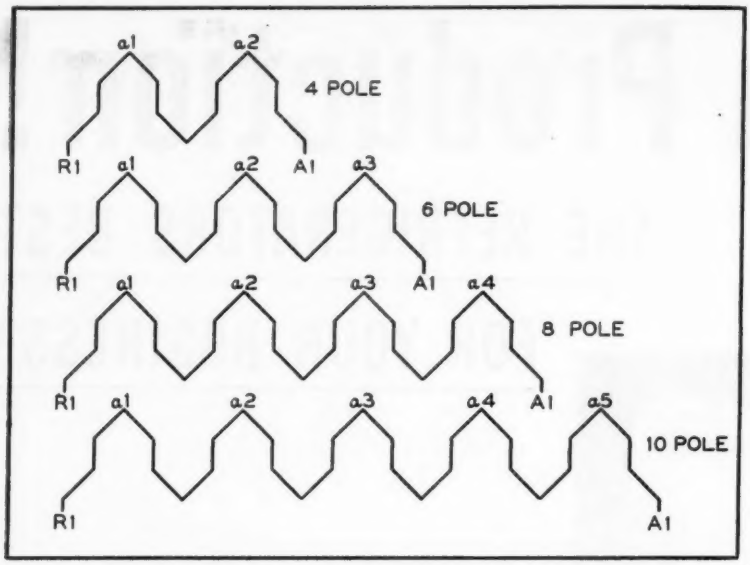

Fig. 9. Corresponding with the series of coils for a four-pole winding shown in Fig. 8, the above diagrams indicate the series of coils for the same type of winding except that the number of poles is varied from four to ten. In the basic wave winding described in Fig. 8, there are two such series of coils for each phase or six series in all.

phase winding would have a total of 24 coils, or 4 in each series. With more than two conductors per slot, the number of coils in series will also increase by a multiple equal to one-half the number of conductors per slot.

The foregoing rules are important as one should remember that any a-c wave winding has six sections, two per phase. If the number of coils in series is divided by six, it will equal the number of coils passed through between the A1 to R1, R2 to A2, B1 to R3, R3 to B2, C1 to R5 and R6 to C2 leads.

The series of two, three, four, etc., coils as shown in Figs. 8 and 9 indicate the number of coils passed through to encircle the winding once depending upon the number of poles. Thus, one-half the number of conductors per slot indicates the number of times we encircle the winding before dropping back one slot. The number of slots-per-pole-per-phase indicates the number of times we must encircle the winding to fill all the slots.

Fig. 2, in the first article (see June, 1945, issue), showed an eight-pole, three-phase winding having 72 slots, three-slots-per-pole-per-phase, and four conductors per slot. An eight-pole winding has four coils in series. Starting at the A1 lead, we progress counterclockwise through four coils, then with four conductors per slot we pass through eight coils before we start through slot 72. With three-slots-per-pole-per-phase, we will have to pass through three slots twice before ending in slot 67 on the R1 lead.

For the above winding, therefore, we will pass through 4 x 2 x 3 or 24 single coils, and encircle the winding six times between the A1 and R1 leads. Each phase will have 48 single coils, in two sections, or 24 in the A1 to R1 series and 24 in the R2 to A2 series.

This arrangement of the series of coils is a basic feature of all a-c wave windings and should be firmly established in one's mind as it will help in the constructing and checking of winding diagrams and the connecting of the windings in the motor.

Back and Front Coil Pitch

As the majority of a-c wave windings are wound with one turn open end coils made from strap copper, either one piece or half coils, we have a back coil pitch (BP) and a front coil pitch (FP) to contend with. In addition, we have the short pitch (SP). These terms will be described briefly so that they will be understood when constructing a diagram.

In Fig. 8 we show a two-coil series for a four-pole winding where the back pitch, marked BP, is 1 and 5. Thus, with one-piece coils, the back

Table I—Possible Slot and Pole Combinations for Any Slot-per-Pole-per-Phase Characteristic of 1 to 10

No. of Poles	Slots-per-Pole-per-Phase									
	1	2	3	4	5	6	7	8	9	10
4	12	24	36	48	60	72	84	96	108	120
6	18	36	54	72	90	108	126	144	162	180
8	24	48	72	96	120	144	168	192	216	240
10	30	60	90	120	150	180	210	240	270	300
12	36	72	108	144	180	216	252	288	324	360
14	42	84	126	168	210	252	294	336	378	420
16	48	96	144	192	240	288	336	384	432	480
18	54	108	162	216	270	324	378	432	486	540
20	60	120	180	240	300	360	420	480	540	600
22	66	132	198	264	330	396	462	528	594	660
24	72	144	216	288	360	432	504	576	648	720
26	78	156	234	312	390	468	546	624	702	780
28	84	168	252	336	420	504	588	672	756	840
30	90	180	270	360	450	540	630	720	810	900
32	96	192	288	384	480	576	672	768	864	960
34	102	204	306	408	510	612	714	816	918	1020
36	108	216	324	432	540	648	756	864	972	1080

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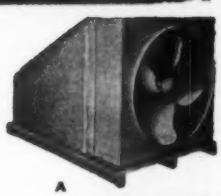
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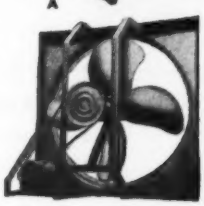
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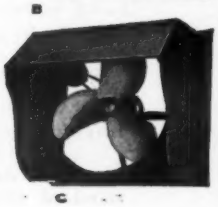
C

D

(A)—TYPE EU PACKAGE ATTIC FAN UNIT
(B)—TYPE ED GENERAL PURPOSE ATTIC FAN
(C)—TYPE AP APARTMENT WINDOW VENTILATING FAN
(D)—TYPE BB ALL-PURPOSE INDUSTRIAL FAN

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NOW! More Facts G·E CIRCLINE

Development of circular fluorescent lamps by General Electric Lamp Research opens up many opportunities for new lighting business in all the major lighting markets. Here, for the first time, is the technical data on the 12-inch G-E CIRCLINE Lamp. Data on two additional circular F lamps (8½″ and 16″ outside diameter, respectively) will be announced later. *Samples are not yet available* but will be distributed at the earliest possible moment. Quantity production will begin as soon as conditions permit. Ballasts, starters and connectors are in process of development. Data will be available through the usual channels.

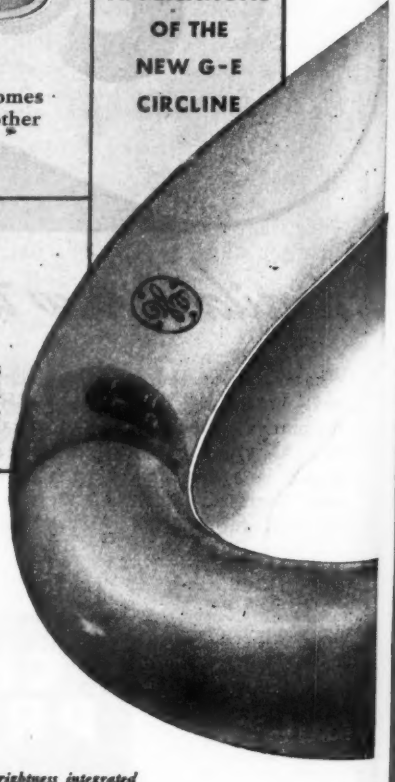
Suggested combination of CIRCLINE and incandescent lamp in portable lamp.

Idea for ceiling fixture for homes and for stores, theaters and other commercial applications.

CIRCLINE Lamp furnishes diffused lighting in this idea for machine tool illumination.

CIRCLINE lamps form directional promenade for stores in this suggestion.

TYPICAL APPLICATIONS OF THE NEW G-E CIRCLINE



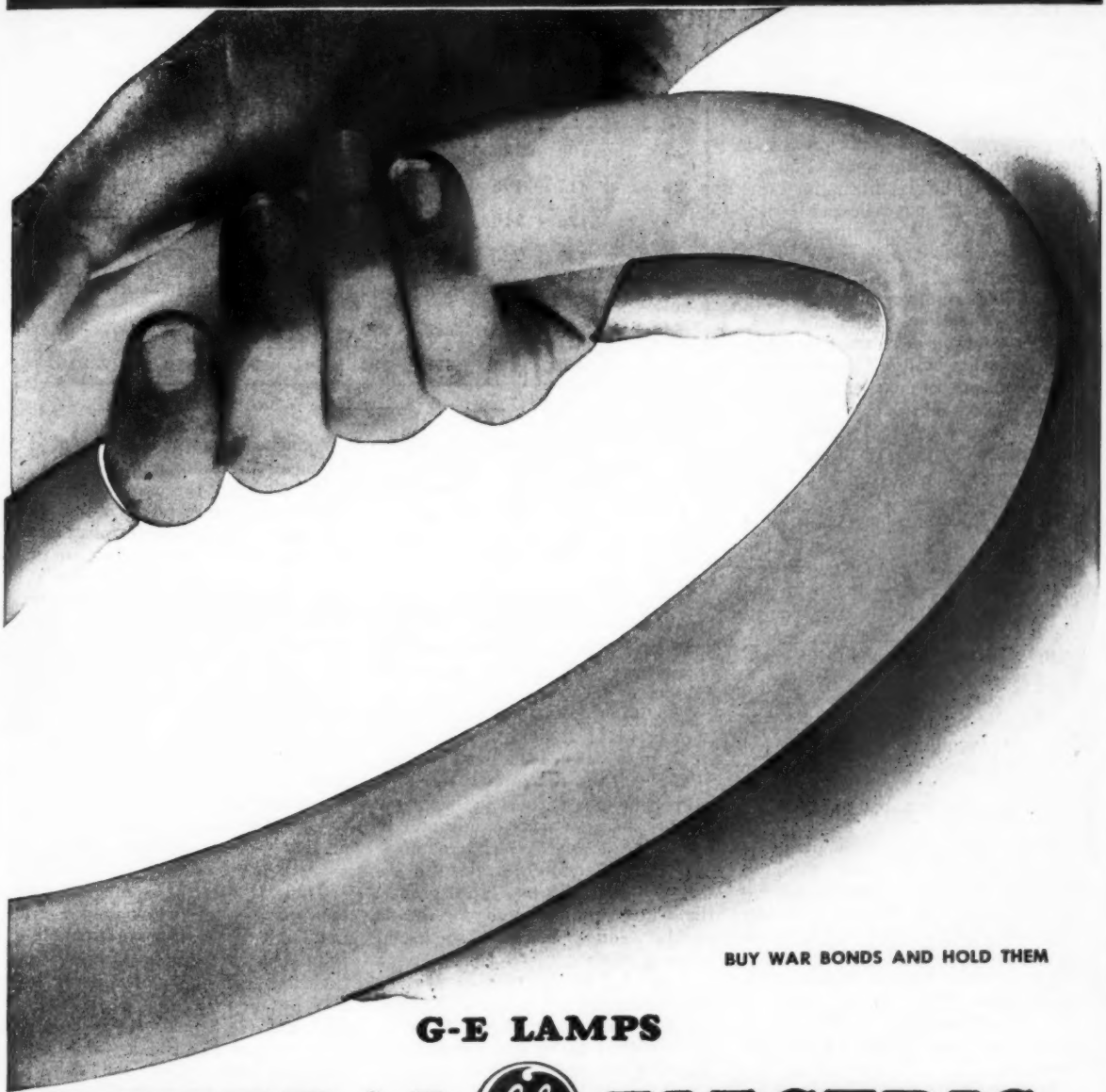
APPROXIMATE DATA FOR 12″ G-E CIRCLINE LAMP

Lamp Watts	32 Watts
Outside Diameter of Circle	12″ ± ¼″
Diameter of Tube	T-10 (1¼″)
Lamp Amperes (operating)	0.42—0.43 Amps
Lamp Volts (operating)	84-86 Volts
Type of Base. . . . 4 Pin	2 pins for each end of tube to provide for cathode preheat)
Light Output (estimate) (White)	1600 Lumens
Brightness—Foot-lamberts (estimate)	2040 Foot-lamberts
Candles/sq. in. (estimate)*	4.5 Candles/sq. in.

Early test data indicate a rated life corresponding to the standard 40-watt T-12 fluorescent lamp.

* *Brightness integrated across the tube diameter in the center of the tube.*

about the New Fluorescent Lamp



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G-E LAMPS

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pitch would be the same for all coils in any one winding. The front pitch, marked FP, in Fig. 8 is also 1 and 5. The full lead pitch, marked LP, is equal to BP plus FP.

With a whole number as 1, 2, 3, 4, etc., slots-per-pole-per-phase, the BP plus FP is always equal to six times the number of slots-per-pole-per-phase, or the BP and the FP are each equal to three times the number of slots-per-pole-per-phase. In Fig. 2 of the first article, the winding has eight poles, three-slots-per-pole-per-phase. Thus, the back pitch and the front pitch are each nine slots, or a pitch of 1 and 10, and the lead pitch, LP, is 18, or 1 and 19.

The 1 and 10 back pitch and front pitch will hold for all three-slots-per-pole-per-phase windings regardless of the number of poles, or the number of slots.

With 1½, 2½, 3½, 4½, etc., slots-per-pole-per-phase, the back pitch and front pitch are not the same, although the lead pitch, LP, is still six times the number of slots per pole per phase. The lead pitch, LP, in all cases will be an odd number, such as 6 x 1½ is 9, 6 x 4½ is 27, etc. In each case, the resultant number is not divisible by two. Therefore, either the back pitch or the front pitch must be larger than the other by one. For example, with 3½-slots-per-pole-per-phase, LP equals 6 times 3½ or 21, and 21 divided by two equals 10½. The back pitch can be 10 and the front pitch 11, or the back pitch can be 11 and the front pitch 10.

In most cases the longest pitch, as 1 and 12 above, would be used for the back pitch, but various manufacturers change the practice, so that with the 1½, 2½, 3½, etc., slots-per-pole-per-phase windings, we have the complication of varying back and front pitch. For this reason, we will cover the 1, 2, 3, etc, slots-per-pole-per-phase windings first, and then the 1½, 2½, 3½, etc., windings will be covered in detail later.

Slots-Per-Pole-Per-Phase

Since the slots-per-pole-per-phase characteristic of a-c wave windings is one of the basic principles governing the new type diagrams, a brief description of the term will be given at this point and enlarged upon during the series. For convenience, the abbreviation SPP will be used for slots-per-pole-per-phase. 3SPP, for example, indicates 3-slots-per-pole-per-phase.

Most modern a-c wave windings are of the two layer type, arranged on a core that has all slots alike. The winding is divided into phase groups, and we will consider only the three-phase windings in this series. Next the slots are divided into pole groups, as four, six, eight, ten, and up.

Thus any true a-c wave winding can have the slots divided into (1) slots per phase, (2) slots per pole, and (3) slots per pole per phase. For three-phase windings, this last grouping is equal to the total number of slots, divided by three times the number of poles.

This number should be a whole number as 1, 2, 3, 4, 5, etc., or a whole number and a half as 1½, 2½, 3½, etc. Thus the number of slots-per-pole-per-phase can be used to identify an a-c wave winding and to divide it into fixed pitch groupings. We can, therefore, divide the a-c wave winding into two broad groups: the whole number, and the whole number and half, slot-per-pole-per-phase groups.

Table I lists the number of slots required to use a true a-c wave winding for windings of from 4 to 36 poles, with 1 to 10 slots-per-pole-per-phase. Thus under one-slot-per-pole-per-phase, we find that a four pole winding would need 12 slots; a six pole, 18 slots; and the 36 pole, 108 slots.

Table II—Possible Slot and Pole Combinations for Any Slot-per-Pole-per-Phase Characteristic of 1½ to 9½

No. of Poles	Slots-per-Pole-per-Phase								
	1½	2½	3½	4½	5½	6½	7½	8½	9½
4	18	30	42	54	66	78	90	102	114
6	27	45	63	81	99	117	135	153	171
8	36	60	84	108	132	156	180	204	228
10	45	75	105	135	165	195	225	255	285
12	54	90	126	162	198	234	270	306	342
14	63	105	147	189	231	273	315	357	399
16	72	120	168	216	264	312	360	408	456
18	81	135	189	243	297	351	405	459	513
20	90	150	210	270	330	390	450	510	570
22	99	165	231	297	363	429	495	561	627
24	108	180	252	324	396	468	540	612	684
26	117	195	273	351	429	507	585	663	741
28	126	210	294	378	462	546	630	714	798
30	135	225	315	405	495	585	675	765	855
32	144	240	336	432	528	624	720	816	912
34	153	255	357	459	561	663	765	867	969
36	162	270	378	486	594	702	810	918	1026

Along each horizontal line of the table, as for example the one for 4 poles, we find the number of slots required for a four pole winding with any given slot-per-pole-per-phase characteristic from 1 to 10. Thus, we find that 108 slots can be used for a 4 pole winding of 9 slots-per-pole-per-phase, or for a 36 pole winding of one slot-per-pole-per-phase, etc. Therefore, the tables can be used to determine how a given number of slots can be used.

Considering further the winding for 108 slots, we find from Table I that it can be used for wave windings of the following characteristics: (1) 36 pole, 1SPP; (2) 18 pole, 2SPP; (3) 12 pole, 3SPP; (4) 6 pole, 6SPP; and (5) 4 pole, 9SPP.

Table II lists the number of slots required for the whole and a half number of slots-per-pole-per-phase from 1½ to 9½. In Table II we find that the 108 slot winding can also be used for (1) 24 pole, 1½ SPP; and (2) 8 pole, 4½ SPP. Thus Tables I and II cover a wide, useful range of slots, poles, and slots-per-pole-per-phase groupings.

In using Tables I and II, one should keep in mind that for all the

(Continued on page 74)

Our Plans are Taking Form

Helping to fulfill the demands of war has been calling on Walker Electrical for 100% of its production, but recent cutbacks in existing contracts has enabled us to again serve commercial consumers... making deliveries to those with orders on file, and to accept other accounts with future delivery contracts.

Gradually, but definitely, the time is approaching when commercial business can again look to Walker Electrical to fulfill its requirements for specialized electrical equipment.

NEWS of the INDUSTRY
National and Southern

PRODUCTION UNDER WAY AT FRIGIDAIRE PLANT

The first household refrigerator manufactured by the Frigidaire Division, General Motors Corporation, since April 30, 1942, was completed at the Moraine City plant on July 25th. It headed a parade of over 50,000 refrigerators that the War Production Board has authorized Frigidaire to build during the third quarter of 1945.

Even though conversion for regular line production has not been completed, actual production is under way. The completion of the first Frigidaire climaxed a period of intensive effort by Frigidaire factory supervisors and workers who performed the gigantic task of reconverting part of Frigidaire's large plant from the building of materials for war to the production of peacetime products in record time.

According to General Manager Edward R. Godfrey, Frigidaire is still devoting a major part of its energies to war production. The greater portion of the huge refrigerator plant, one of the world's largest, is still busy with the production of propellers including those for the B-29 superfortress.

As announced by the War Production Board, refrigerators that will be built for some time will not be available for sale to the public but will be added to the country's frozen stockpile and released subject to WPB regulations. They will be distributed to military establishments, hospitals, and other highly essential places. At this time it is not known how soon refrigerators will be sold for public consumption.

The first Frigidaire to come off the assembly line was the Model MI-7 and it will be followed by Models DI-7 and DPI-7. All of these models have a food storage capacity of 7 cu. ft., a shelf area of 12 sq. ft. and large frozen storage capacity. They will be equipped with drawer type meat tenders, sliding cold storage trays and sliding glass top hydrators. The dimentions are 60" high, 30-⅝" wide at base, and 25-⅝" deep. All of the refrigerators will be equipped with the Meter-Miser sealed rotary type compressor which is permanently sealed and requires no oiling.

Other features will be aluminum Quickube ice trays, featuring Frigidaire's built-in instant-cube release and automatic tray release, and a cold control for regulating freezing speeds and cabinet temperatures.

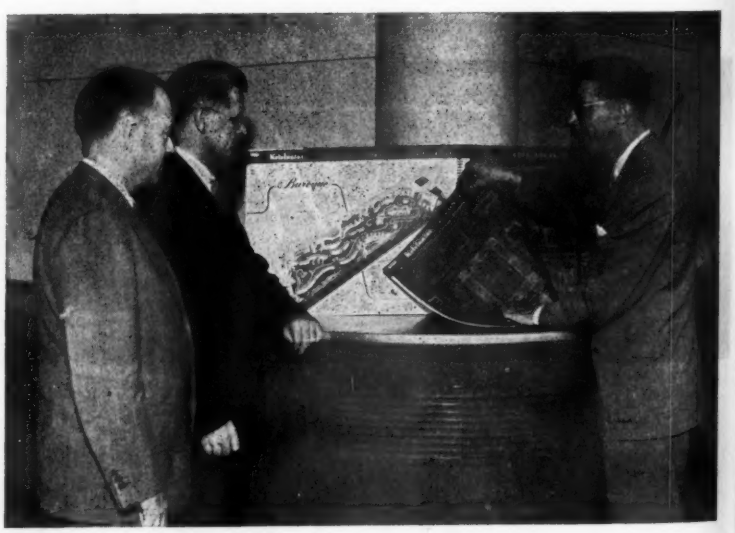
The refrigerant will be "Freon-114", the safest known refrigerant, developed by Frigidaire and General Motors.

General Manager Godfrey stated Frigidaire is now producing a limited number of electric ranges and commercial refrigeration equipment and that production of additional Frigidaire products would begin as soon as materials and machinery become available and war production needs permit. These products will include Frigidaire's full line of refrigerators, electric ranges, water heaters and home freezers. Also such commercial refrigeration and air conditioning products as beverage, milk and water coolers, ice cream cabinets and air conditioners.

KELVINATOR RETAILERS STORE DISPLAY MANUAL

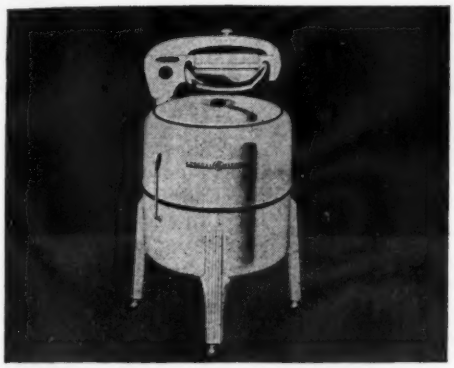
The first major element in Kelvinator's unfolding program of "postwar" retailer marketing support — an imposing 40-page, four-color store display manual, designed to provide an up-to-the-minute guide and reference-work for dealers planning store and display improvements—is being distributed after nearly a year of intensive preparation and development.

"Nearly all retailers are planning improvements in their facilities in preparation for the postwar market, and this new manual, developed by our own merchandising staff with the assistance of the ablest retail display authorities in the country, provides practical and imaginative guidance," C. J. Coward, director of advertising



Now being distributed to retailers after a year of development and preparation, Kelvinator's new appliance display book, "Displaying Appliances of Tomorrow" receives a final approving nod from officials. Left to right, Charles T. Lawson, vice-president of Nash-Kelvinator Corporation in charge of Kelvinator sales; D. A. Packard, assistant general sales manager, and C. J. Coward, director of advertising and sales promotion.

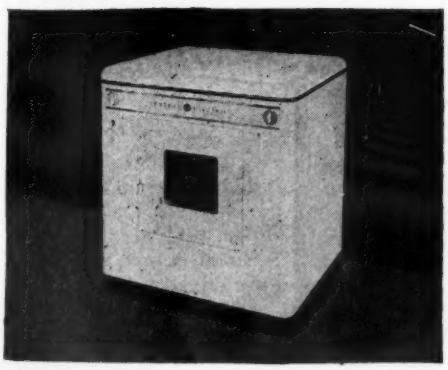
NOW! Get in the Home Laundry Business with the Complete G-E Line!



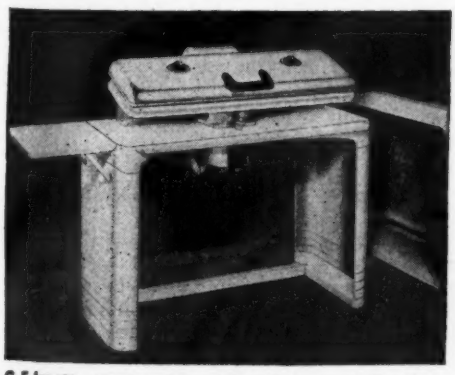
G-E Washer—One-Control Wringer! Maximum safety and convenience. Even pressure—can be "set" for any fabric. "Permadrive Mechanism." Only 4 moving parts. Little to wear. Needs no oiling.

Gentle "Activator Action." Thorough, but always easy on clothes!

Streamlined styling. White baked enamel finish, rust-resistant. Welded legs. Fast-drain.



G-E Dryer—New! Dries clothes *indoors*, rain or shine, and does it in a jiffy. Gentle "tumbler" action, thermostatically controlled. Stops automatically. A marvelous new G-E convenience, with a *big* waiting market!



G-E Ironer—The "sit-down-and-iron" Automatic Flatplate Ironer! Easy to operate. Automatically controlled heat. Turns out big ironings quickly, beautifully. 300-square-inch board permits ironing *two* flat pieces at once!

General Electric is back in home laundry production again!

For three years the G-E Home Laundry factory has been turning out vital war weapons. We're still turning them out. But Uncle Sam has told us we can make washers, ironers, and dryers for the home front.

The sales-sensational G-E One-Control Wringer Washer is beginning to roll out of the factory now. You'll get yours SOON. The complete line will be in your store at the *earliest possible date.*

Greatest Market in History

WPB says 4,621,000 people want washers. Surveys show that 53 out of 100 women believe General Electric makes the best electrical appliances for the home.

Get set *now* to cash in on this tremendous market by featuring an ensemble laundry sale—G-E Washer, Ironer, and Dryer.

And—yes—there's a new G-E Automatic Washer coming! We honestly believe it will revolutionize the automatic washer business!

Send for the Self-Starter Package

All the sales promotion material you need is ready to go!

Tell your distributor you want the General Electric Home Laundry Equipment Self-Starter Package. In it are striking folders, displays, sales training helps. Order yours *today* from your G-E Distributor! General Electric Co., Appliance and Merchandise Dept., Bridgeport, Conn.

Tell your customers to listen to Art Linkletter, in "The G-E House Party," every afternoon, Monday through Friday, 4 p. m., E.W.T., CBS, telling millions of women about G-E Home Laundry Equipment.

FOR FINAL VICTORY—BUY AND HOLD MORE WAR BONDS

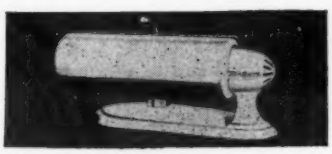
"The Appliances Most Wanted By Most Women"

GENERAL ELECTRIC

WE'RE TELLING WOMEN THE G-E HOME LAUNDRY STORY!

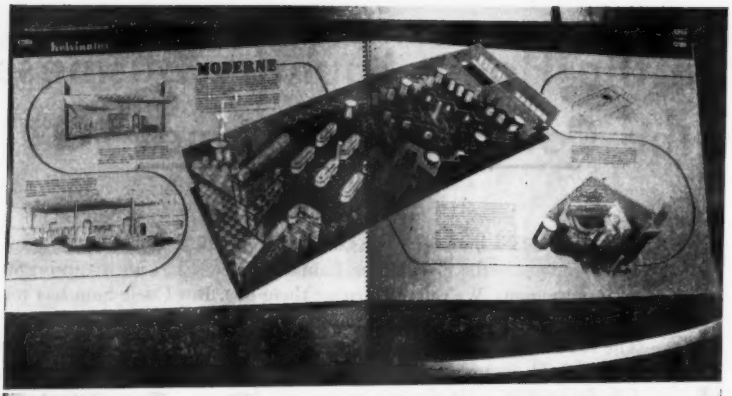
With hard-selling advertisements, that reach city women and farm women all over America. Every month, color advertisements appear as follows:

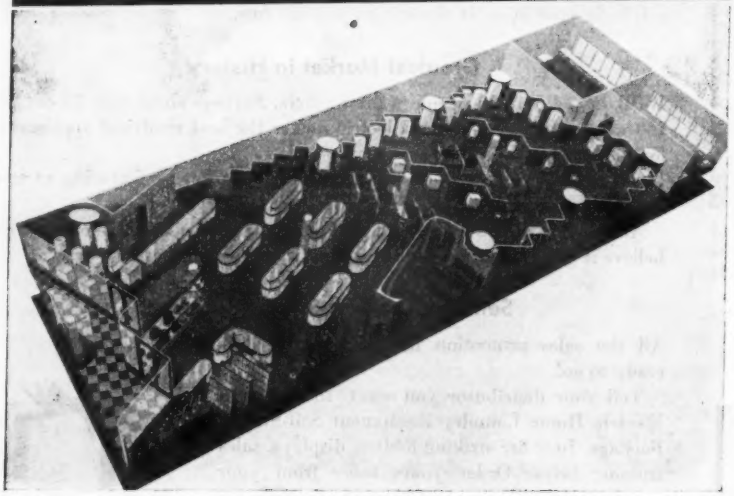
Collier's—Mar. 17, May 12, June 30, Aug. 4, Sept. 1, Nov. 24, Dec. 15; *Woman's Home Companion*—Feb., April, June, Aug., Oct., Dec.; *Parents'*—Jan., Feb., May, July, Sept., Nov.; *Farm Journal*—Mar., June, Aug., Sept., Dec.



G-E Portable Rotary Ironer at a low price! Weighs only 33 pounds, but does a full-size job. Women love it! A price leader!

New! G-E Automatic Portable Rotary Ironer Brand-new addition to the G-E Home Laundry line! Light and easy to carry. Fully automatic. To sell at a bargain list!





(Above) This full-color spread is typical of the attractiveness and practicability of Kelvinator's new appliance display manual, "Selling Appliances of Tomorrow" which is being distributed by the company as part of its program of support to retailers. (Below) Typical of the practical plans suggested is "Moderne," an oblique floor plan arrangement, featured as one of the six basic display styles in Kelvinator's new appliance display book. This particular layout is designed for a 50-foot frontage, but like all of the styles in the manual, is fully adaptable, with a number of variations suggested in line drawing.

and sales promotion, Kelvinator Division, Nash-Kelvinator Corporation, declared.

"We are certain that the book will be found extremely useful, in the immediate future, when all of the arts of merchandising will be called upon, and in years to come. As a curtain-raising contribution to the success of the retailer in the active markets ahead, we think that it presents further vigorous evidence of the company's retail-mindedness."

Complete with accurate, detailed construction blueprints, the new display manual, called "Displaying Appliances of Tomorrow", provides plans for six basic styles of store and appliance display, adaptable for use in both 25 and 50 foot store widths, and appliance departments of various sizes and requirements. The plans, covering everything from store fronts to model kitchens, are completely flexible and provide a wide variety of adaptations.

The basic styles are Colonial, which aims at creating the traditional impression in a homelike manner; Baroque, which employs the rich ornamentation of the 16th Century architecture; Moderne, contemporary and streamlined; Simplicity, very decorative and flexible; Cascades, the basic design motif "is drawn from the color and sparkle of a waterfall"; Functional, which permits almost unlimited arrangements.

In each of the styles, planning is comprehensive, down to the smaller details. Bays, background panels, windows, floors, showcases, audition counters, shelves, "closing" arrangements—all of the physical details of good merchandising—are covered in the manual.

Addressing the retailer, introductory copy declares that "one of your most important responsibilities to your business is to make sure that your store is prepared to do the job you will expect of it—that it is not just a store of yesterday—but a store for the tomorrows."

"Remember," the copy continues, "that stores have definite personalities. They attract or repel; excite or depress; inspire confidence or generate doubt. They influence the reactions and attitudes of those who visit them just as surely as the sales people who work in them.

"Thus the wise merchant who has his eye on winning customers and holding their patronage will not be content with a store that is merely a sheltered space in which to stock and display merchandise. He will use his store and its displays as mediums for shaping the attitudes of his patrons; he will make them a creative force with which to get business."

NORGE TURNS OUT WAR AND PEACE PRODUCTS

Output of "motors" for the latest-type, 5-inch rocket soon will be started under prime Navy contract in the Muskegon, Mich., plant of the Norge division of Borg-Warner Corp., it was announced by Howard E. Blood, Norge president.

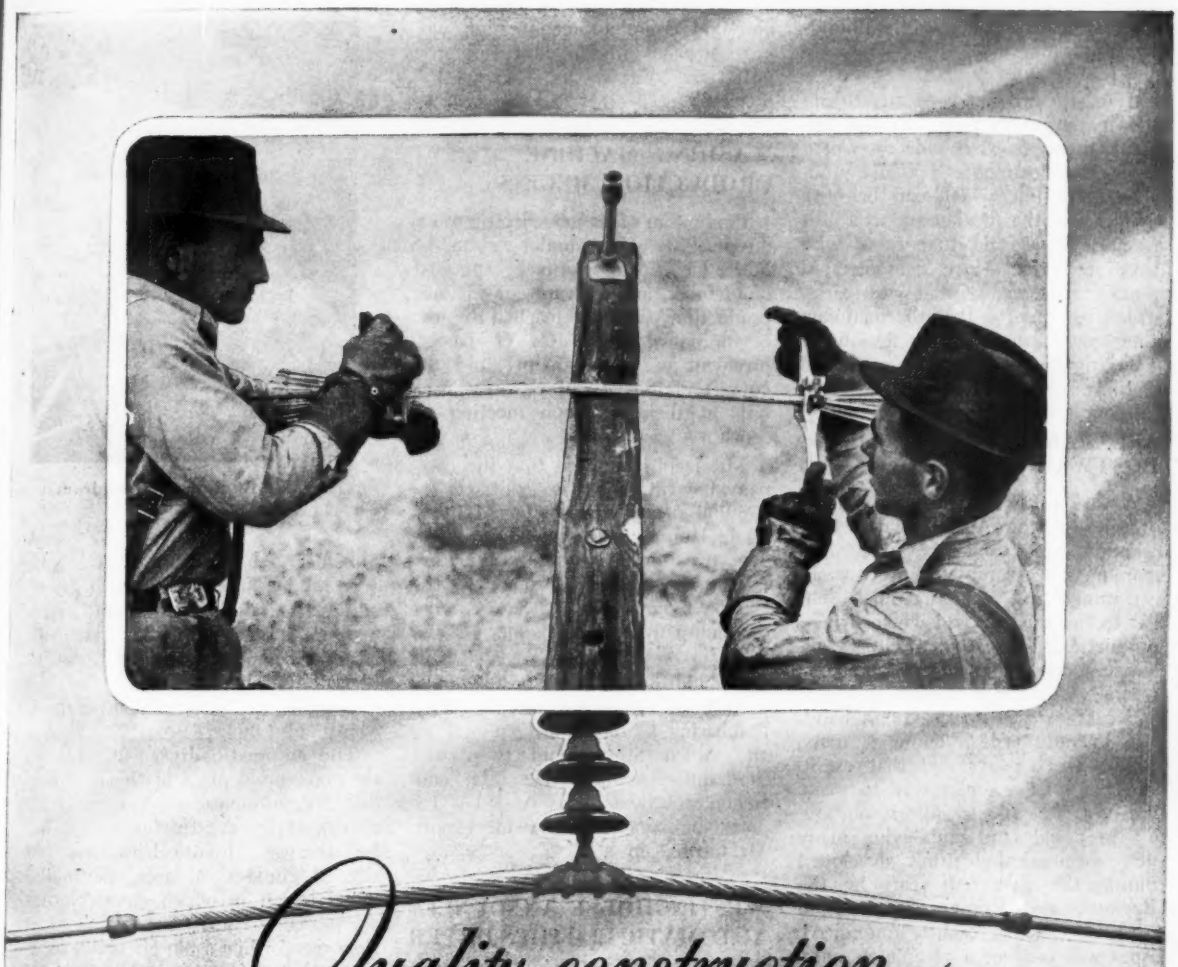
At the same time, Mr. Blood disclosed that the firm has begun manufacture of hermetic compressor mechanisms for refrigerators in this same factory, and thus will bring about side-by-side production of war and peace products under one roof.

Because of its highly secret nature, the company was not permitted to disclose any details of the rocket-building program, other than to announce it is producing the "motor," or section of the projectile which contains the impelling charge.

The refrigerator compressors are being manufactured in line with the company's consumer goods reconversion program which contemplates resumption of refrigerator production in the fall.

NEW APPLIANCE GOSSIP

A survey conducted by the Building Supply News among its readers to determine, among other things, the new lines which building supply dealers expect to add after the war, will be of interest to electrical appliance dealers and wholesalers. The largest number of replies mentioning any one item indicated that they expect to



Quality construction ~

IN EVIDENCE AT EVERY POLE TOP

Armor rods prove to men familiar with line construction that here's a line which has been carefully and wisely engineered; no skimping on first costs, to be paid for later because of higher operating costs.

Alcoa Aluminum armor rods reinforce conductors at points of support, preventing vibration failures. Armor rods also prevent chafing, take the brunt of flashovers at insulators, and are invaluable for repairing lines where such damage already has occurred.

For help on engineering your lines—design, stringing, or maintenance—consult Alcoa, makers of Alcoa A.C.S.R. and line fittings. ALUMINUM COMPANY OF AMERICA, 2164 Gulf Building, Pittsburgh 19, Pa.

ALCOA A-C-S-R

add electrical appliances to their building supply lines.

* * *

Tide, the magazine of advertising and marketing, reports that an announcement may be made soon of a remarkable new home appliance product—a machine which can be used both as a clothes washer and as a dish washer. It is said that those who have seen the device demonstrated claim unreservedly that it works. Tide's comment is that the manufacturer may have a rugged job in achieving quick consumer acceptance of the product's idea.

APEX ANNOUNCES POSTWAR LINES

A. C. Scott, vice-president in charge of sales of the Apex Rotarex Corporation, announced that Apex would manufacture a complete line of washers, ironers and vacuum cleaners similar to the models used when civilian production was stopped in 1942. These reconversion products include several wringer type washers, portable and cabinet type ironers, floor, hand, and cylinder type vacuum cleaners.

Mr. Scott also stated that extensive plans were under way to make the postwar appliance line revolutionary in design and embodying many new mechanical features developed during the past few years by the Research and Engineering Division of Apex. As was recently announced, Apex will produce a completely automatic washing machine, which at the present time is undergoing rigid field tests and will be available for the postwar market.

Mr. Scott said that no commitments would be made by the factory when these reconversion models would reach the market. At the present time, Apex plants are still maintaining heavy war production schedules and complete reconversion will be postponed or delayed temporarily until war contracts are lessened appreciably.

WASHING MACHINE PRODUCTION BEGINS

Production of its new electric washing machine will be under way in the F. L. Jacobs Co. plants by the first of October, and "a very considerable production" will be reached by the beginning of 1946, Rex C. Jacobs, president of the company, told the New York Society of Security Analysts at their luncheon meeting recently.

Mr. Jacobs reported that the company has firm purchase contracts for 275,000 of its completely automatic home laundry machines. Of the orders, two hundred thousand are from distributors located throughout the country, who will sell the unit under the company's brand name "Launderall."

An additional fifty thousand units have been contracted for by Allied Purchasing Corporation, representing the Allied Stores, and twenty-five thousand machines have been contracted for by Charles A. Kools Export Company for worldwide export, Mr. Jacobs said.

WESTINGHOUSE ANNOUNCES AUTOMATIC CLOTHES DRYER

An entirely automatic clothes dryer that will eliminate "blue Mondays" in the postwar laundry through a tumbling or "fluffing" process that literally brings the warmth of the sun and the gentle action of breezes indoors, is announced by Westinghouse.

"This new dryer, which makes it unnecessary to iron some pieces, will be an important part of our postwar

The Westinghouse Laundromat

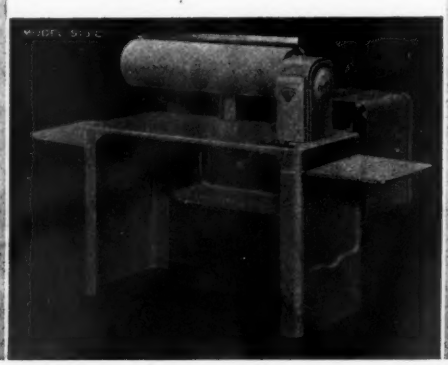
appliance program and we will go into mass production for national distribution just as soon as facilities and materials are available," said J. H. Ashbaugh, vice-president in charge of the Electric Appliance Division of the Westinghouse Electric Corporation, Mansfield, Ohio.

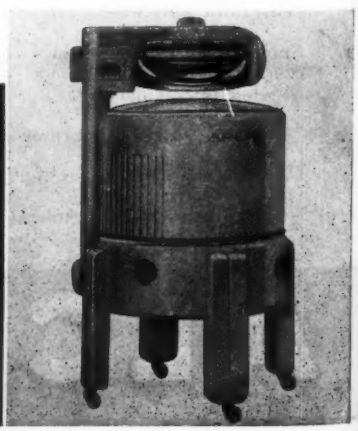
The automatic dryer will become the companion piece of the Laundromat, the automatic washing machine developed by Westinghouse just before the war. Identical in shape and size, it contains a large, perforated metal basket in which damp clothes are placed. The basket is rotated at slow speed while a fan circulates heated air that carries away the moisture.

BEAM PRODUCES FIRST SHIPMENT OF WASHERS

Believed to be the first factory shipment under the WPB's authorization for limited resumption of civilian washing machine production, a truckload of Coronado washers left the Beam Manufacturing Company fac-

Typical appliances that will come from Apex production line soon.





Typical page from "Design for Selling." In the book it appears in striking natural colors.

Exclusive for Frigidaire Dealers... Store Planning Guide Created by Frigidaire and Raymond Loewy!

See what happens when Frigidaire's merchandising "know how"—outstanding in the major appliance field—is combined with the genius of Raymond Loewy Associates, famous designers of scores of the nation's leading stores!

It's "Design for Selling," a great new store planning guide available soon to *Frigidaire dealers exclusively!* It points the way to far more efficient selling because it—

Shows how to make completely functional use of floor space.

Is designed for use with any type of store, any size department, any style of decoration.

Provides working drawings which enable a local architect or builder to re-design any Frigidaire dealer's store or department.

Presents full-color drawings which show what can be accomplished with varying types of stores and departments.

Includes invaluable advice on store location, department location, store fronts.

Most important of all, "Design for Selling" offers Frigidaire dealers a sound, basic sales-floor *IDEA* which locates display and selling areas on, but not in, the line of traffic . . . concentrates customer attention upon the product being sold . . . makes step-up selling easy . . . enables the salesman to progress from approach to close without a break!

Frigidaire Store Planning Guide and Frigidaire Dealers

This exclusive new store planning guide is one more example of the leadership that has created thousands of requests for the Frigidaire franchise. With such leadership—demonstrated in Customer Research, Market Research, Engineering, Manufacturing, Merchandising, Service—Frigidaire dealers can be sure of continued... *Leadership in Sales!*

Look to Frigidaire for Leadership through DEALER AIDS

For Victory
In War Production

FRIGIDAIRE
Division of
GENERAL MOTORS

DAYTON 1, OHIO • LEASIDE 12, ONTARIO

Pioneering builders of
REFRIGERATORS • RANGES • WATER HEATERS
HOME FREEZERS • ICE CREAM CABINETS
COMMERCIAL REFRIGERATION • AIR CONDITIONERS
BEVERAGE, MILK, AND WATER COOLERS

tory on July 1. The machines, first produced by Beam since the WPB "freeze" on May 16, 1942, were bound for the Minneapolis headquarters of Gamble-Skogmo, Inc., operators of Gamble Stores.

In the Beam company's plant at Webster City, Iowa, where washers were produced prior to the war, a production line of washers started operations within a few yards of another production area which turns out Azimuth indicators for tanks and tail fin assemblies for 81-mm. trench mortars.

Reconversion of part of the Beam company's facilities to civilian production was permitted by Ordnance Department cut-backs in war production schedules. The Beam company was authorized by the WPB last November to begin fabrication of washer parts if it could find materials and manpower. Materials were obtained on spot authorizations, subject to war requirements, and when the "official starting date" for assembly of complete washers arrived, a crew was ready to start civilian production.

VEST POCKET RADIO SET PLANNED BY SENTINEL

What is described by its creator, the Sentinel Radio Corporation, Evanston, Illinois, as an innovation in radio set convenience and utility, is the new vest pocket Sentinel radio planned for early production.

To be inconspicuously carried in vest pocket, shirt pocket, handbag, or concealed about the person, the new vest pocket Sentinel will be several times smaller than the smallest camera or personal type radio sets manufactured prior to the war. It will provide good radio reception at all times. Its batteries are self contained, and its aerial is contained in the wire leading to the ear-piece.

Here will be a radio set of obvious appeal. It can easily be carried to ball games, on the golf course, on shopping tours—anywhere and everywhere. It can be operated anywhere without disturbance to anyone—on the street, on trains and planes, even in the quiet of a club or library reading room.

The "speaker" or ear-piece of the new Sentinel vest pocket radio will be entirely inconspicuous—of the approved hearing-aid type. The complete unit includes radio, batteries, tubes in the small, marvelously compact case—not much larger than a cigarette case.

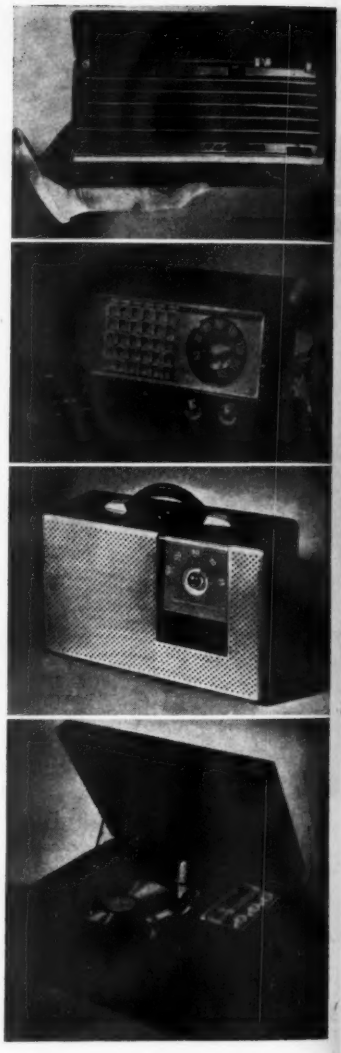
Sentinel's Pocket Radio

EMERSON RADIO LAUNCHES "HEAD START" CAMPAIGN

With a program entitled "Head Start Toward Civilian Radio Business," Emerson Radio and Phonograph Corporation has launched a definite product-and-policy campaign with specific models, approximate descriptions and prices and equitable merchandise allocations to the trade. Announcement of Emerson's forthcoming production and promotion operations was made at highly enthusiastic distributor meetings in New York and Chicago recently.

While contingent upon the release of materials and manpower and Government rulings with regard to price and discount structures, the program set forth at the two distributor sessions was to all intents and purposes a head start toward the resumption of normal manufacturing and selling. The dramatic product and promotion exhibits —reminiscent of pre-war showings, but expressive of radio and television in the world of tomorrow—portrayed actual new radio models, a galaxy of advertising and sales promotion plans and materials and a program calling for immediate distributor-salesman-dealer activity in all territories.

With the promise and provisional description of many additional models to come, Ben Abrams, president of Emerson Radio, presented the first four new basic models which the company is planning to manufacture in huge quantity as rapidly as facilities and materials are released for that purpose. While making it entirely clear that there is to be no let-up of Emerson's war production, Mr. Abrams stated that the head-start program is in every way consistent with the Government's policy and desire to bring about an orderly and rapid transition from wartime to peacetime functions within the radio industry.



The Emerson Radio postwar line will start with the four models shown here. Model designations and approximate retail prices, reading from top to bottom are: Pocket Receiver, $25; Compact Model 502, $25; Portable Model 505, $35; and Phonoradio Model 506, $85.

The forerunner Emerson Radio models include a compact set to retail in the neighborhood of $25.00, a portable set at $35.00, a phonoradio at $85.00 and a pocket receiver at $25.00. The descriptions and prices of the sets were stated to be approximate only and subject to later change as costs and conditions indicate. While tube complements and other components were not revealed at the distributor meetings, it was demonstrated that

FOR SAFETY'S SAKE . . . USE CONDUIT *(Full Weight Rigid Steel)*

Makeshift Wiring Methods are "OUT" for Reconversion

BACK in the days when America was producing "too little and too late," the electrical industry had to accept certain less-than-excellent practices for wiring buildings. Codes that have insured safety under all conditions had to be suspended in the face of dire emergency. But, of course, plants with this emergency type of wiring were designed to operate that way only a few years at most.

Today, America is thinking about converting these plants to permanent peacetime use. So it is extremely important that all temporary wiring systems be converted, too--through replacement with permanent, full-weight, standard-threaded, rigid steel conduit systems.

Buckeye conduit, known everywhere for its high excellence and uniform quality, gives maximum protection against tampering, crushing, dust, dirt, moisture, vapors, vibration, explosions. It is available now through your distributor.

For your new peacetime jobs, as well as for reconversion jobs, you can now throw out makeshift wartime practices and specify and use BUCKEYE conduit, to insure permanent wiring protection of which you can always be proud.

QUALITY YOUNGSTOWN SERVICE

YOUNGSTOWN
THE YOUNGSTOWN SHEET AND TUBE COMPANY
YOUNGSTOWN, OHIO
Manufacturers of
CARBON - ALLOY AND YOLOY STEELS

Ask your distributor for:
Youngstown Buckeye Conduit...Pipe and Tubular Products...Sheets...Plates...Electrolytic Tin Plate...Coke Tin Plate...Bars...Rods...Wire...Nails...Tie Plates and Spikes.

reception power, output and other technical features represented vast improvement over pre-war sets in the same categories.

G-E'S CUSTOMER DIVISION RENAMED

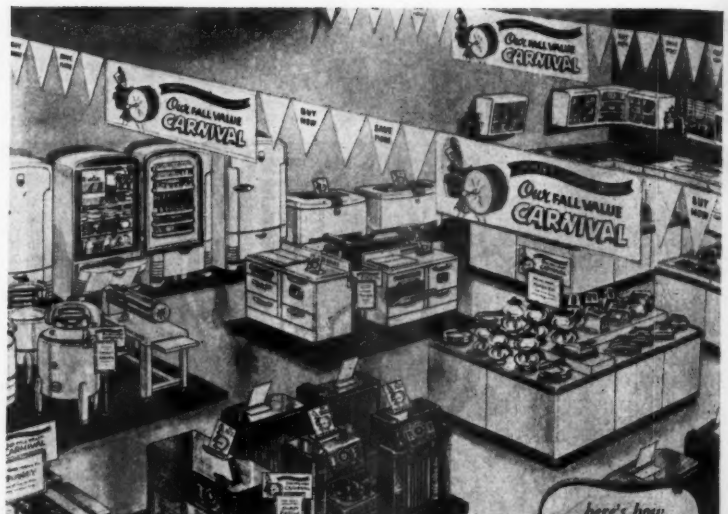
Effective June 1, the name of the Customer Division of General Electric's Central Station Divisions was changed to the Electric Utility Division, with R. W. Beard appointed manager, according to an announcement by W. V. O'Brien, manager of the company's Central Station Division. The Electric Utility Division will have general over-all responsibility for promotion and sales operations with all electric utility customers.

MODERNIZATION PROGRAM FOR CROSLEY DEALERS

Retailer dealers throughout the country, franchised to distribute Crosley home radio receivers and major household appliances as soon as their production is resumed, are rearranging, re-furnishing and redecorating their stores to be in readiness for their first shipments of peace-time goods.

Crosley field sales representatives report that hundreds of these dealers are planning to modernize their stores in line with a program suggested by the Crosley Sales Promotion Institute.

To present its store modernization program directly to its thousands of retail dealers, The Crosley Corporation is now conducting a series of regional meetings in principal cities, at which Bert Johnston, head of the Crosley Sales Promotion Institute, and S. D. Mahan, Crosley director of advertising and public relations, are demonstrating the institute's program.



The suggested layout shown above is typical of the information presented to Crosley dealers by the Crosley Institute. A new book entitled "Peter Van Modernizes His Store" is now available.

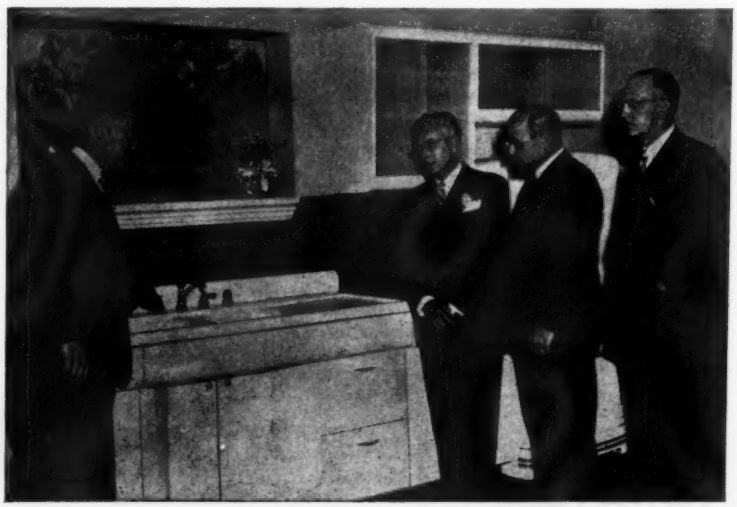
Flexibility of arrangement and intelligent discrimination in the selection of store display material are keynotes of the Crosley Institute's program, according to Mahan.

"Correct store layout and fixturing is not only simple but inexpensive," he pointed out, at one of the meetings of Crosley dealers. "No merchant can afford to install elaborately-designed equipment, so specifically built to handle one type of merchandise that it becomes a total loss if necessary to adopt that space for the sale of any other type of goods."

In addition to its store-planning counsel, the program of the Crosley Sales Promotion Institute includes a year-round promotional service, based on the over-all needs of dealers' stores. At regular intervals, complete store display material goes out to members "to breathe new life into the store," as Johnston pointed out.

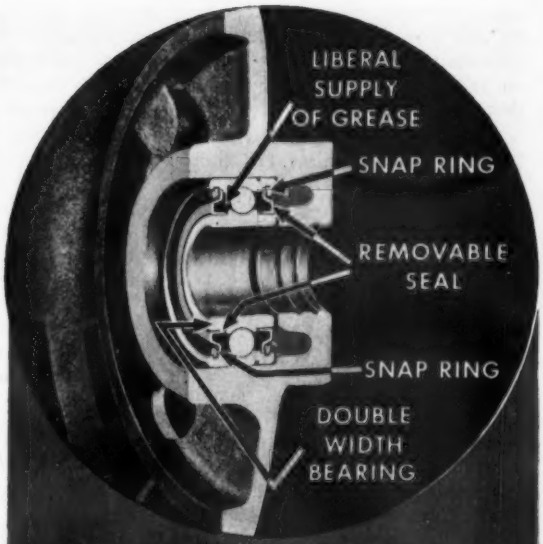
This service includes material for two major sales events, one in the spring and one in the fall; a colorful set of display material for Christmas, and special trims for six special occasions to liven up what are generally the less colorful seasons of the selling year.

The year-round program also includes plans for other promotional activities, such as premium deals, sales contests, store demonstrations, botanical services, animated displays, store openings, sales incentive plans, hints of special merchandising for the Christmas season and others. Dealers



Officials of the Crosley Corporation are shown above witnessing a demonstration of the new Crosley line of kitchen cabinet and sink equipment. E. A. Bonneville, manager of the kitchen cabinet and sink division of the Crosley sales department is shown at the extreme left. At the right (from left to right) are J. H. Rasmussen, general sales manager, manufacturing division, Crosley Corporation, E. C. Brode, Crosley manager of distribution, and S. D. Mahan, Crosley director of advertising and public relations.

ANOTHER WESTINGHOUSE MOTOR "FIRST" WHICH REDUCES INDUCTION MOTOR MAINTENANCE TO A NEW LOW... NOW STANDARD ON TYPE CSP MOTORS, 3 HP AND BELOW



Install now... lubricate once between 1945 and 1955! Think of what this means in terms of man-hours saved—because you can forget lubrication of Type CSP Motors for *5 years* or more after they are installed.

Prelubricated ball bearings are not new in Westinghouse Motors. They have been proved in thousands of textile motor applications—which have run continuously for 7 years and been found in perfect condition after that time.

The CSP motor is another example of the extensive and continuous Westinghouse developments which have contributed to induction motor design. For full information, call your Westinghouse office—ask for DB-3100-CSP, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-21330

only ONE lubrication...

BETWEEN 1945 AND 1955!

OTHER ADVANTAGES OF WESTINGHOUSE TYPE CSP PRELUBRICATED MOTORS

- **Longer grease life**
- **TUFFERNELL Insulation**
- ***Die-cast Rotor* with oversize fan**
- ***Dynamically Balanced Rotor***
- ***Liberal Through-Ventilation*—air enters front and leaves at drive end of motor**

Westinghouse
PLANTS IN 25 CITIES ... OFFICES EVERYWHERE

TYPE CSP MOTORS

are also provided with bulletins and booklets covering the latest thinking on various phases of store merchandising.

Johnston has just prepared a book, "Peter Van Modernizes His Store," for the use of members of the Crosley Institute. This book deals with store planning and fixturing, stressing the importance of flexibility and simplicity.

UNIVERSAL CLEANER MODELS ANNOUNCED

Landers, Frary & Clark, manufacturers of Universal electrical appliances announces that it will produce a cylinder type vacuum cleaner, conventional floor model and a hand model cleaner which it hopes to allocate in limited quantities to the trade in the fourth quarter of the year.

Universal's tank type cleaner will feature the exclusive Tattle Tale Light which flashes when dirt bag needs emptying, preventing a loss of suction due to overfilled bag; the Air-tight connection where the hose slides smoothly into the opening and makes an absolute air-tight seal between the cleaner and hose by turning the knurled collar; exclusive thread-picking, self cleaning nozzle, scientifically designed to permit use of much more powerful suction; rubber sealed air-tight germ trap which thoroughly cleans and purifies air and 13 attachments: 8½ foot hose, thread picking, self cleaning nozzle, bare floor brush, floor polisher, radiator tool, utility brush, can of deodorant moth proofing unit, germ trap filter, sprayer, 2 straight wands and a drapery nozzle.

The Universal conventional brush type cleaner will possess a motor driven oilless bearing brush, ball bearing motor, chrome handle and hard rubber handle grip, single nozzle adjustment tilting device on side of handle ball, patented rear swivel wheel, envelope type easy-to-empty bag.

The Universal standard model hand cleaner which can be used for cleaning car interiors, homes apartments, and stores has a deodorizer, moth exterminator and blower attachment. It weighs only four pounds and is designed to worm its way easily into all hard to get at places. A natural grip handle above the motor gives perfect balance and is easy on the arm and wrist. A dust proof bag, which contains a sleeve valve prevents dust from falling back into nozzle.

BANKERS CONSIDER SALES FINANCE PLAN

Bankers throughout the South are giving consideration to a "National Sales Finance Plan" through which the banks propose to capture some of the installment financing business of the nation. One of the first of such meetings was held in Atlanta, recently, with Mills B. Lane, Jr., vice-president of the Citizens and Southern Bank of Atlanta, presiding. Mr. Lane, who is a member of the national executive committee of the new plan, said that the plan proposes a national, unified program among banks to handle the installment purchases of consumers' durable goods.

"The plan has the approval of manufacturers and retailers," Mr. Lane asserted, and as soon as the banks get organized properly to handle installment financing, business will be ready to sign contracts for them to do so.

The new plan, Mr. Lane asserted, will accomplish these things:

1. It will provide appliance buyers with a local agency (their own banks) to handle their installment payment notes.

2. It will offer installment buyers a lower interest rate than was generally available before the war. Rates may be as low as 6 per cent on the unpaid balance.

3. It will offer appliance dealers a floor plan to help them finance their inventories during the period when appliances are on their floors or in their warehouses. The cost to dealers for this floor plan service would be held to a minimum, with the banks offering a rate just high enough to cover expenses, and these rates may be as low as one-half of one per cent per month.

REPORT ON HOME LIGHTING RELEASED BY I. E. S.

The first official Recommended Practice of Home Lighting has recently been released by the Illuminating Engineering Society. The report, developed and prepared by the Society's Committee on Residence Lighting, appears in the June issue of Illuminating Engineering, and will be available soon as a separate 40-page, 6 x 9 illustrated booklet, with cover.

The I.E.S. Recommended Practice of Home Lighting constitutes an authoritative guide for the lighting of all of the major rooms and various seeing tasks in the home. Its recommendations are based on the findings of home lighting specialists of many years' experience and represent the most comprehensive and official study of this subject heretofore published. In addition to the fundamentals of adequate lighting, the report covers such subjects as color and its relation to light, fluorescent and filament sources in the home, built-in lighting, placement of lamps, and includes also a table of footcandle recommendations for numerous seeing tasks in the home.

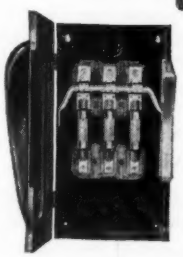
Each room in the home is studied separately and specific recommendations made for its lighting, including drawings of suggested light-fixture types. Thirty-six illustrations included in the booklet graphically demonstrate the beauty and excellent seeing conditions achieved by the lighting recommendations presented.

It is expected that the I.E.S. Recommended Practice of Home Light-

Legionnaires

Vacu-Break SAFETY SWITCH with "CLAMPMATIC" CONTACTS

Sizes for Every Switch Job



For greater safety and dependability, longer life and lower upkeep costs, leading plants the country over depend on BullDog Vacu-Break Safety Switches.

Designed in a wide variety of sizes and types with capacities ranging from 30 to 1200 amperes, standard models of this famous switch are available for every industrial requirement.

No other safety switch has "Clampmatic" contacts, tight as a bolted connection in the ON position, to reduce heating—the Vacu-Break principle of arc suffocation to snuff out destructive arcs as quickly as they form—new simplified operating mechanism in modern streamlined cabinet.

Talk to expert BullDog field engineers about the electrical distribution problems in your plant. Or write us for literature.

BUY WAR BONDS

SALVAGE PAPER

BULLDOG

ELECTRIC PRODUCTS COMPANY

BOX 177, R. PK. ANNEX, DETROIT 32, MICHIGAN. BullDog Electric Products of Canada, Ltd., Toronto. Field Offices in All Principal Cities.

Also Manufacturers of

SafToFuse Panelboards—Switchboards—Circuit Master Breakers—Universal Trol-E-Duct, for flexible lighting—Industrial Trol-E-Duct, for movable "loads"—BUS-tribution DUCT, for "Plug-In" Power.

ing will be of special value to architects, interior designers and decorators, home economists and many others interested in the welfare and comfort of the American family.

The booklet is available from the Illuminating Engineering Society, 51 Madison Avenue, New York 10, N. Y., in single copies or in quantity lots.

ATTITUDE OF UTILITIES ON FEDERAL PROJECTS

One hundred and sixty-seven of the nation's electric light and power companies, representing a large part of the business-managed electric industry, in a joint statement recently made known their position with regard to proposed river developments by the United States Government. These developments, providing for the creation of the Missouri Valley Authority and other projects similar to TVA, as well as the completion of several already in operation, entail an estimated initial expenditure in excess of $3,850,000,000.

Four specific points are made by the electric companies in defining their attitude toward these government undertakings:

1. Whenever a dam is proposed, all of its purposes should be clearly defined in the legislation—flood control, navigation, irrigation or power.
2. Government produced power should be sold to existing power systems without special privileges or discrimination, so as to avoid costly duplication and to insure widest use and lowest rates.
3. Any savings thus effected should be passed along to consumers under state or other regulations.
4. Government may properly regulate business, but should not operate business.

Utility Executive's Viewpoint

In discussing the joint statement of the 167 electric companies, C. Hamilton Moses, president of the Arkansas Power and Light Company, said:

"This announcement is designed to clarify the position of the electric companies regarding river developments along the pattern of TVA. The companies have been wrongfully charged with attempting to block such valley developments.

"This is an injustice to the electric companies. We do not oppose any government project of this kind provided it is economically sound. What does concern us is the threat of annihilation of the business-managed electric industry by the use of taxpayers' money to subsidize government power plants unfairly competing with the American business man."

The Viking Air Conditioning Corporation, Cleveland, Ohio, recently enlarged its plant facilities by adding another floor to its building and occupying an adjacent building. The new building houses new and heavy presses which were installed for the manufacturing of invasion pipe clamps for the Armed Forces. These giant presses will be convertible to Viking's postwar operations in the manufacturing of blowers, humidifiers, attic and industrial fans.

BENDIX ENTERS HOME IRONER AND DRYER FIELDS

Bendix Home Appliances, Inc., manufacturers of the Bendix automatic home laundry, recently announced its entrance into the home ironer and home dryer fields. The new products were previewed at a series of distributor round-table conferences held at the factory during June.

The new Bendix automatic home ironer, according to company officials, accomplishes the results of the best features of the rotary and flat plate ironers which were on the market before the war. They also believe that it is as far advanced over pre-war offerings as the famous Bendix automatic home laundry is over the conventional washing machine.

The Bendix distributors were also shown a model of the postwar Bendix automatic home laundry, which incorporates 14 improvements over the last machine made in 1942.

The new Bendix automatic ironer and dryer as well as the improved Bendix automatic home laundry are the result of four years of spare time research by the Bendix engineering and design staffs. Dozens of the models of the Bendix appliances have been on laboratory tests and tested in homes, and today's products will be the result of untold research.

Production on the Bendix automatic home laundrys started July 1, and it is expected that each of the 8,000 dealers will be supplied with floor demonstration units by early fall, according to H. K. Lyons, director of distribution. Production on the new Bendix automatic home ironer and dryer will follow at a later date.

W. F. Linville, director of districts, conducted the meetings and presented the Bendix line to the distributors. In his talks at the meetings, Mr. Linville outlined the entire sales program to the organization and explained in detail the mechanical features which make each product the outstanding one in its field.

One of the most complete advertising programs ever presented in the appliance industry was outlined to the Bendix distributors by W. J. Daily, advertising director. The program encompassing all phases of advertising includes newspaper advertising, national publications, radio, motion pictures, trade papers, business publications, electric signs, dealer window displays and department store displays. Mr. Daily also announced that this program would be supplemented with both national and local publicity.

NEW APPLIANCE STORE OPENED IN ARKANSAS

Clyde E. Fish and his son, Clyde K. Fish, now with the Marines on Okinawa, are the owners of the Farm & Home Appliance Co., opened in Star City, Ark., July 1.

The new store has in stock a complete line of farm and home appliances including refrigerators, radios, home heating equipment of all types, furnaces, washing machines, G-E irons and toasters, electric fixtures for the home and office, and a newly equipped service department.

Featuring YOU—9,747 Premier Dealers!

In the cast that is destined to play a big part in putting over the box-office hit produced by Premier, you—and 9746 other top-notch appliance dealers—play a leading role. Indeed it was only natural that the country's foremost dealers should want to increase their wide public following by appearing opposite such a sure-fire box-office star as the Premier!

Now that government restrictions on the manufacture of vacuum cleaners have been lifted, finer Premiers than ever before will soon be on the way. And you'll get them in ever increasing numbers as Premier obtains more men and more material to build them. But because of the tremendous backlog of cleaners needed by American homemakers, the demand will exceed the available supply for quite a long time to come.

Premier's 79 distributors, with nearly 10,000 carefully selected dealers, have promised that there will be "One Premier To Every Franchised Dealer Before Any One Gets Two." It is suggested that your best interest will be served by using this first Premier as a sample for display and demonstration in taking orders for future delivery.

So get ready to take part in the return of an old favorite to an eager public. And remember, the Premier is the kind of Attraction that will bring people in to see the whole picture of your store!

ELECTRIC VACUUM CLEANER CO., INC. • CLEVELAND 10, O.

Money Still Talks . . .

and its language will be heavily accented with a crisp, folding sound, now that your customers know they will save $10 to $20 on the new Premier since it will be sold only through you, the authorized retailers.

PREMIER

"All That the Name Implies"

Guaranteed by Good Housekeeping

"LABEL OF QUALITY" ADVERTISING FEATURE

Swinging its big advertising guns onto future appliance selling, D. H. Holmes Co., Ltd., one of New Orlean's large department stores, recently began plugging for Bendix and G. E. appliance sales in full page newspaper advertisements.

The ads are part of a campaign of combined institutional and selling pages that have been running over the Holmes signature for more than six months. They tie in "The label of quality"—the D. H. Holmes label

—with the labels of nationally advertised brands. Featured thus far among appliances are GE and Bendix; and the store expects to plug other lines as it straightens out the franchise situation and the merchandise itself comes nearer to being on its floors.

In addition to Bendix home laundries, the full GE line was used: refrigerators, washing machines, unit kitchens, and home deep freeze units. Holmes expects an increased demand for these last two, which formerly were small sellers in the department store field.

SCHICK WILL RESUME CIVILIAN PRODUCTION

Kenneth C. Gifford, president of Schick Incorporated, announces that the production of Schick electric shavers for civilian consumption will again be resumed, since the War Production Board lifted the limitation order which, since the spring of 1942, restricted the industry to war production.

Schick's Stamford plant had utilized its precision tools and skilled workmen in the production of stadimeters and airplane engine oil filters during these years. In the past six months, the Government permitted limited production of Schick electric shavers for the use of our Armed Forces overseas, and for hospitalized veterans.

COMMITTEE APPROVES WIRING STANDARDS

The Industry Committee on Interior Wiring Design met in New York recently with the review of the Residential Wiring Standard and the Farmstead Wiring Standard, as submitted by the Technical Subcommittee, as the prime order of business.

Both standards were approved by the committee with minor changes. These standards are now going to the sponsoring associations for formal approval prior to printing. It is expected that the books will be available in printed form later this year.

The contents of the Residential Wiring Handbook covers among other items — requirements for outlets, branch circuits, feeder circuits, service entrance, signal and communications, radio and television, and telephones.

The Farmstead Handbook is divided into two parts; the first part dealing with the interior wiring design of farmstead buildings, and the second part with exterior distribution on the farm. Part I consists of several sections, each section covering structures for a given enterprise — dairy structures, poultry structures, beef cattle structures, horse structures, hog structures, sheep structures, field crops, fruit and vegetable crops are among the items covered. In addition, sections will be found on farm shop and machinery sheds, water supply, farm residence, etc. Part II covers the various types of metering on a farm, i.e. pole, outdoor, and indoor; exterior lighting is included and many tables on demands, voltage drops, etc., are given.

Action on standards for "Multiple Family Dwellings and General Occupancies" will be delayed until the Residential and Farmstead Handbooks are ready for distribution. The Technical Subcommittee was requested to proceed with a study of a "Wiring Standard" for application to low-cost housing.

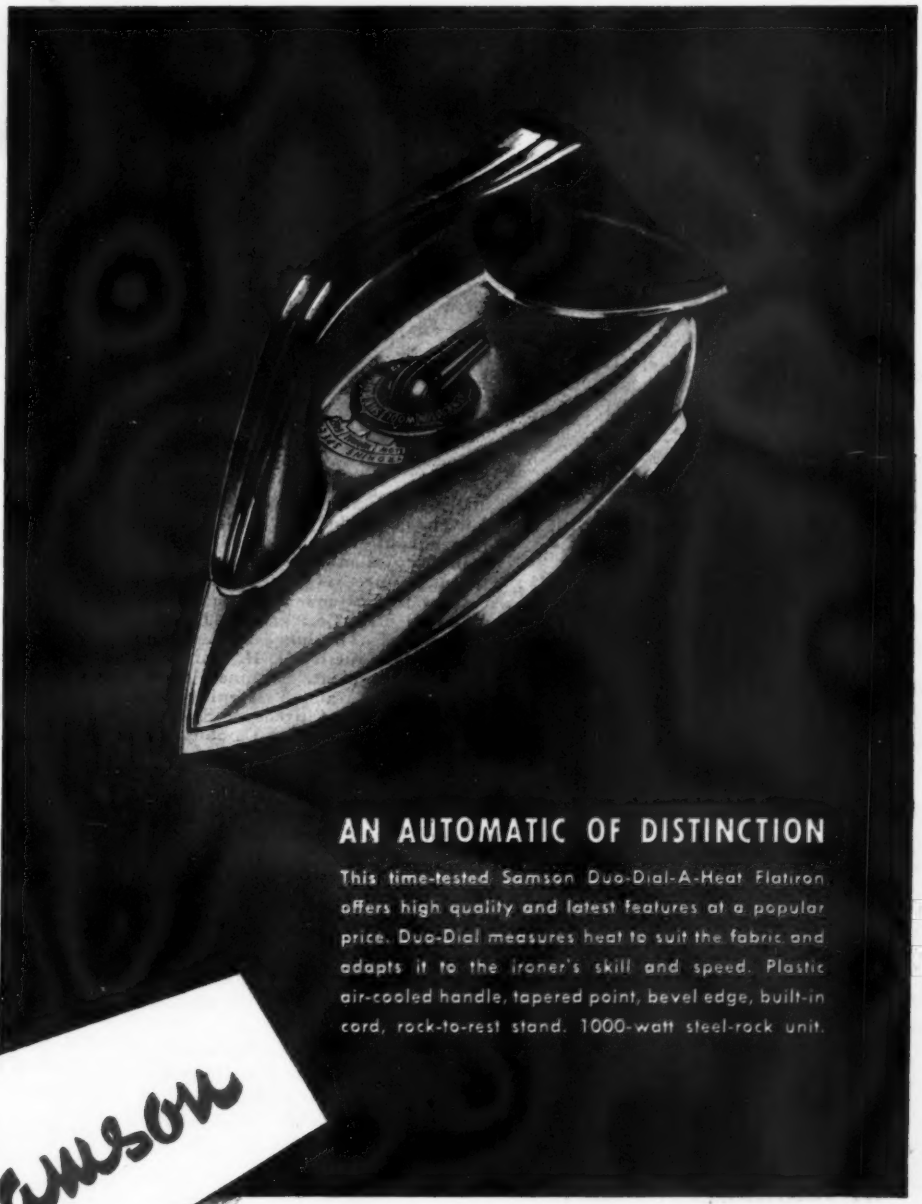
The Technical Subcommittee which has been at work on the Residential and Farmstead Wiring Handbooks for about one year is composed of nine members. A. Carl Bredahl is chairman, with Morris Lloyd and H. R. Stevenson as chairmen of the sectional subcommittees on Farmstead and Residential Wiring respectively. Arthur Abbott, Leo Dolkart, H. G. Knoderer, George McKee, C. P. Wagner, and C. A. Ward complete the committee.

The Industry Committee on Interior Wiring Design is under the chairmanship of E. A. Brand of the Buffalo, Niagara, & Eastern Power Corporation; A. Carl Bredahl of the Westinghouse Electric Corporation is secretary. The committee is sponsored by ten groups; namely, the American Institute of Electrical Engineers, American Lighting Equipment Association, American Society of Agricultural Engineers, Edison Electric Institute, International Association of Electrical Inspectors, Illuminating Engineering Society, National Electrical Contractors Association, National Electrical Manufacturers Association, National Electrical Wholesalers Association, and Radio Manufacturers Association.

I.E.S. SOCIETY ELECTS VICE-PRESIDENT

W. A. Feuillan, Jr., secretary, Lighting Fixture & Electric Supply Co., Inc., New Orleans, wholesalers of lighting fixtures and electrical supplies, has just been elected vice-president of the Illuminating Engineering Society, —composed of the country's leading illuminating engineers, physicists, optometrists, etc., for the Southern region, comprising the states of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Arkansas, Tennessee and Louisiana.

The Society's members and committees have carried on basic studies and researches resulting in the publication of hundreds of technical papers and numerous reports, which have



AN AUTOMATIC OF DISTINCTION

This time-tested Samson Duo-Dial-A-Heat Flatiron offers high quality and latest features at a popular price. Duo-Dial measures heat to suit the fabric and adapts it to the ironer's skill and speed. Plastic air-cooled handle, tapered point, bevel edge, built-in cord, rock-to-rest stand. 1000-watt steel-rock unit.

Samson

FACTS ABOUT SAMSON UNITED TODAY AND FOR THE FUTURE

Right now limited numbers of Samson Automatic Flatirons are on their way to Samson dealers. In the near future more of our war-expanded facilities will be used to provide larger and larger quantities of these Samson Automatic Irons.

Other quality-built Samson appliances, including the Samson Heating Pad with 3 Fixed Heats and Safe-T Selective Heat Circuit, the Samson Variable Control Table Range and the Samson Safe-flex Rubber Bladed Fan will follow as soon as conditions permit. Watch for further announcements concerning these and other Samson United items.

BUY BONDS

SAMSON UNITED CORPORATION, ROCHESTER 10, N. Y.

Samson United of Canada, Limited, Toronto

served both as a stimulus and a source of basic data for the advancement of the lighting art, leading to increased safety and production in industry and providing added comfort for innumerable visual tasks.

The Society through its membership and committees cooperated with all government agencies in meeting the special problems of protective lighting, the blackout, lighting for production, as well as in the development of special equipment for Army and Navy combat forces.

The New Orleans Chapter, one of the most active in the country, has nearly 50 members at present.

ANNUAL ELECTION HELD BY TEXAS ASSOCIATION

Members of the San Antonio Electric & Gas Appliance Association held their annual election of officers recently with the following being elected to office:

T. A. Beniteau, Broadway Auto Supply, president; H. L. Roper, Alamo Distributing Co., vice-president; and Walter H. Meyer, A. C. Toudouze Co., secretary-treasurer.

Directors were elected as follows: W. C. Rowles, retiring president, who becomes an ex-officio member of the board; Ralph Iltis, F. L. Haufee, A. J. Krisch, H. J. Helliwell, and Lloyd Darby.

It was also voted to change the name of the body to the Appliance Association of San Antonio, and to take out papers of incorporation.

The association meets on the second and fourth Monday of each month and, under the leadership of Mr. Rowles, enjoyed an increase in membership from 18 to 30.

350 FARM HOMES WIRED BY OKLAHOMA STUDENTS

The manpower shortage has not prevented some 350 farm homes from being wired for electric service in the territory served by the Northfork Electric Cooperative, Sayre, Okla., according to a report by Cecil M. Neeley, manager. An interesting point in this report is the fact that nearly all of the newly connected farms in the five counties served by this co-op were wired by 27 students from the New Liberty Consolidated School.

Credit for this vocational training of the students goes to M. E. Fariss, superintendent of the school. Mr. Fariss, an experienced electrician himself, had wired some of the farms in the vicinity during his spare time. When the manpower shortage indicated that many of the farm buildings and homes might not be wired even though distribution lines had been extended to them, Mr. Fariss interested a group of students in the work, gave them basic training, and assisted them in obtaining materials, planning the jobs, and handling the details of the work in a business-like manner.

According to Mr. Neeley, manager of the cooperative, the co-op inspector has gone over every one of the jobs wired by the students "with a fine-tooth comb" and has not had to turn down a single job.

DEALERS MEET IN SAVANNAH—More than fifty dealers were in attendance at the first dealer meeting of Lindsay and Morgan Company, of Savannah, electrical appliance distributors. Among those who addressed the all-day session were Fred A. Davis, president, and Fred A. Ray, vice-president, respectively, of Lindsay and Morgan Company; Fred C. Hastings, general sales manager, and J. W. Derr, district manager, of American Central Mfg. Co.; and O. J. Long, sales manager, Quaker Manufacturing Company. The luncheon meeting shown above included a number of distinguished guests: H. H. Hillyer, president, Savannah Gas Company; C. C. Curtis, president, Savannah Electric & Power Company; H. V. Jenkins, publisher, Savannah Morning News and Evening Press; W. F. Murphey, vice-chairman, Citizens & Southern National Bank, and the late Thomas Gamble, Mayor of Savannah.

ELECTRICIANS ALLOWED MORE COPPER WIRE

An amendment of CMP Regulation 9A, effective July 21st, brings good news to electricians, electrical contractors, and electrical repairmen. They can again purchase up to $150 worth of copper wire and cable in a calendar quarter instead of $75 worth. The latter figure was in effect from February 15th to July 21st. The copper wire inventory is increased from 15 days' to 30 days' supply, and that should prove helpful to this branch of the electrical trade. Conditions made it necessary, however, to add neon sign transformers to the list of items not purchasable with the AA-3 rating.

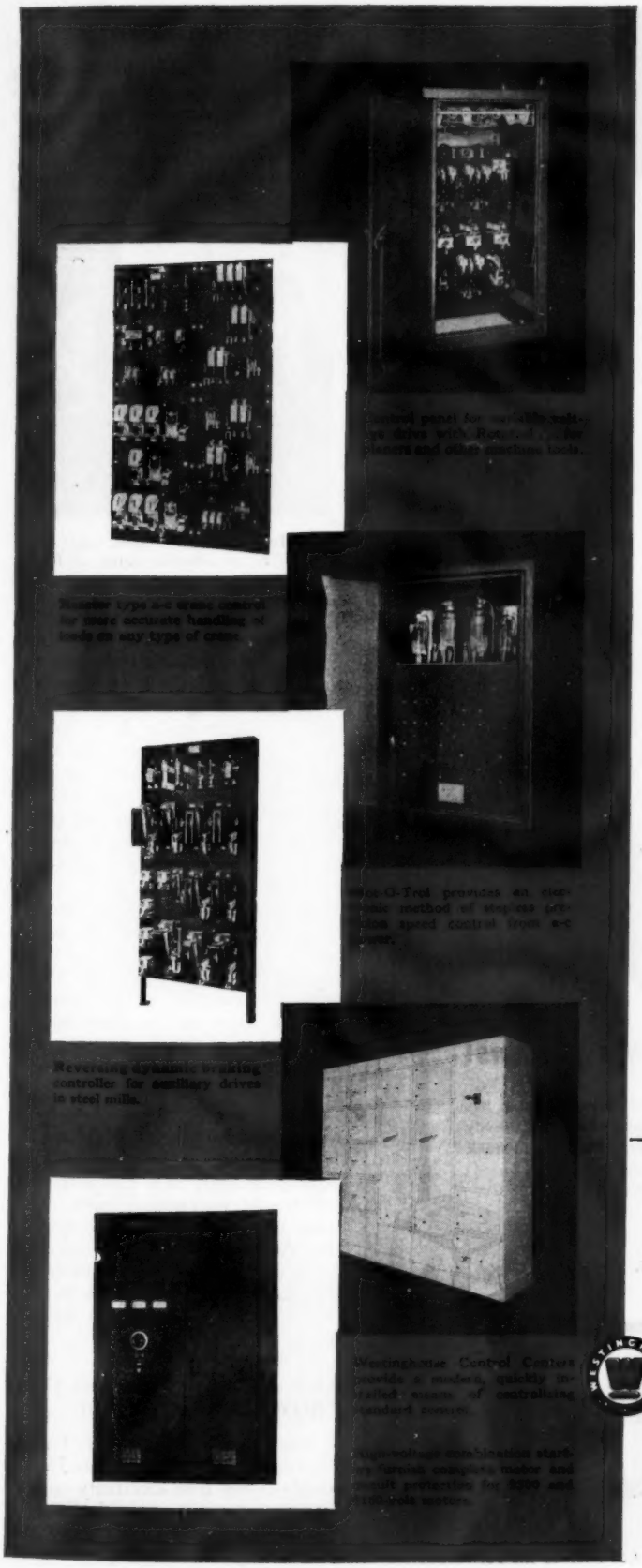
GEORGIA POWER TO SERVE 2,500 MORE FARMS

With the lifting of wartime restrictions, the Georgia Power Company's long-awaited program of rural electrification is now getting under way. According to an announcement by C. A. Collier, vice-president, 500 miles of new electric lines will be built to serve 2,500 farms and the work will proceed as rapidly as supplies of materials and availability of manpower permit.

Unless unexpected difficulties are encountered, the 500 miles of rural lines, to be constructed at a cost of $700,000, will be completed this year. Of the 500 miles of lines, 100 miles are now in process of construction.

The 2,500 farm families who will receive electric service for the first time are located in various parts of the state where the power company provides service. During the war period, the company has received many thousands of applications for rural electric service. In building the new lines, the power company will give first consideration to those projects which can serve the greatest number of farms for the investment of still-limited manpower and materials.

Mr. Collier said that the construction of 500 miles of rural electric lines represents about all the power company can accomplish this year.



For any Motor Control

...call Westinghouse

Control properly selected and applied makes it easy to put motors through their paces . . . to stand up and deliver. Application of control can be greatly simplified also by making one supplier responsible for the entire motor drive.

Westinghouse motor control not only covers the entire range of standard a-c and d-c controls and accessories for every type of drive, but many specialized types of control like those shown at left. Regardless of the job, you are assured of a completely co-ordinated installation. Call your Westinghouse office, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-60587

Selection of Westinghouse standard motor control is greatly simplified by this 290-page Buying Data book. If you do not have a copy, phone or write your Westinghouse office for Catalog 7000.

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

Motor Control

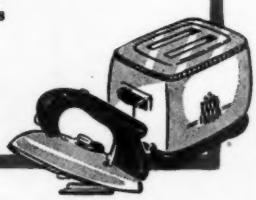
From one . . . many!

YOU can make many different kinds of toast with a Proctor—the "toaster with a crisper!" Light, dark, soft, crisp, Melba . . . an almost infinite number of kinds. No wonder the Proctor *completely* automatic toaster was a newsmaker from the day it hit the market!

Good post-war numbers!

And speaking of numbers, Proctor has more newsmaking features on tap . . . ready for post-war appliances. Plan now to stock and sell the "good numbers" in Proctor's great post-war line!

Meanwhile, keep on buying WAR BONDS.



PROCTOR

PROCTOR ELECTRIC COMPANY, DIVISION OF PROCTOR & SCHWARTZ, INC., PHILADELPHIA 44, PENNA.

NEWSMAKER IN APPLIANCE MERCHANDISING

WICKARD TAKES OATH AS ADMINISTRATOR OF REA

Claude R. Wickard took the oath of office as administrator of the Rural Electrification Administration on July 2. The oath was administered by REA Personnel Chief John W. Asher, Jr. At the same time, Mr. Wickard released the following statement:

Claude R. Wickard, right, takes oath of office as administrator of REA.

"To me the electrification of the six million still unserved rural homes is one of the nation's truly great unfinished jobs. It is a job that must be finished as practically and as expeditiously as possible. It is a job the steady accomplishment of which will bring immeasurably increased happiness and efficiency to farm people and at the same time add greatly to the economic and social stability of our entire nation. It will strengthen democracy.

"Reaching that goal will not be easy. There will be obstacles in our paths. Some of them will be there because we are blazing new trails even after a decade of operation—and some of them will be there because of activities of those who are not always thinking in terms of the public interest.

"To overcome these obstacles it will be necessary for all who have the REA program at heart to work together resolutely in a completely unselfish and cooperative spirit. I assume my duties as Rural Electrification Administrator with a feeling of humbleness in this responsibility and I earnestly and sincerely seek the support of everyone who wants REA to reach its goal."

NEW FARM BOOK AVAILABLE FROM WESTINGHOUSE

A new farm book entitled "Putting Electricity to Work on Your Farm," which shows how electricity can be used to increase profit and offset the manpower shortage, has been announced by the Westinghouse Elec-

POWERS

DOING A *BIG* JOB IN A BIG WAY FOR UTILITIES ALL OVER AMERICA!

ALL-STEEL POWERS PUBLIC UTILITY BODIES

Here's the ideal body for line construction and maintenance work. Designed for service plus, the POWERS Series 600 C Line Body guarantees efficient, economical operation. It's especially designed and engineered to provide comfortable and safe crew accommodations, adequate space for equipment and tools. Be sure of avoiding delays in delivery of your POWERS Line Body as soon as truck chassis are again readily available, by planning with us NOW.

McCABE POWERS AUTO BODY CO. · 5901 N. Broadway · St. Louis 15, Mo.

tric Corporation. This 52-page book is designed as a guide in planning how to put electricity to work on the farm and in the home.

By illustrations and facts obtained from experiment stations and actual farms, many applications of electricity that benefit the farmer are described. Convenience and better living in the farm home is also stressed with suggestions on how time saved can be put to other profitable uses.

The new farm book is being distributed to farmers through dealers, utilities, and rural electrification cooperatives, who may obtain supplies at five cents per copy from Westinghouse distributors, or from the Electric Appliance Division, Westinghouse Electric Corporation, Mansfield, Ohio.

NEW ELECTRONIC PLANT OPENED IN FLORIDA

The Continental Electric Company of Geneva, Ill., manufacturers of electronic tubes, rectifiers and photo electric tubes, has recently opened a new plant south of West Palm Beach, Florida. It is of modern concrete construction and offers the latest in electronic manufacturing science in electronic tube fabrication and assembly.

The first rectifier and charger bulb was sealed on the line in this new plant in June, and production was started on July schedules for this new service to the automotive, electrical and electronic trades served by this company.

The pioneer production will be concentrated in mercury vapor and gas filled rectifiers. These items are extensively used by the automotive trade on battery chargers, as well as by theater supply houses, electrical distributors, and electronic radio jobbers.

SLIMLINE LAMPS FOR SERIES CIRCUITS

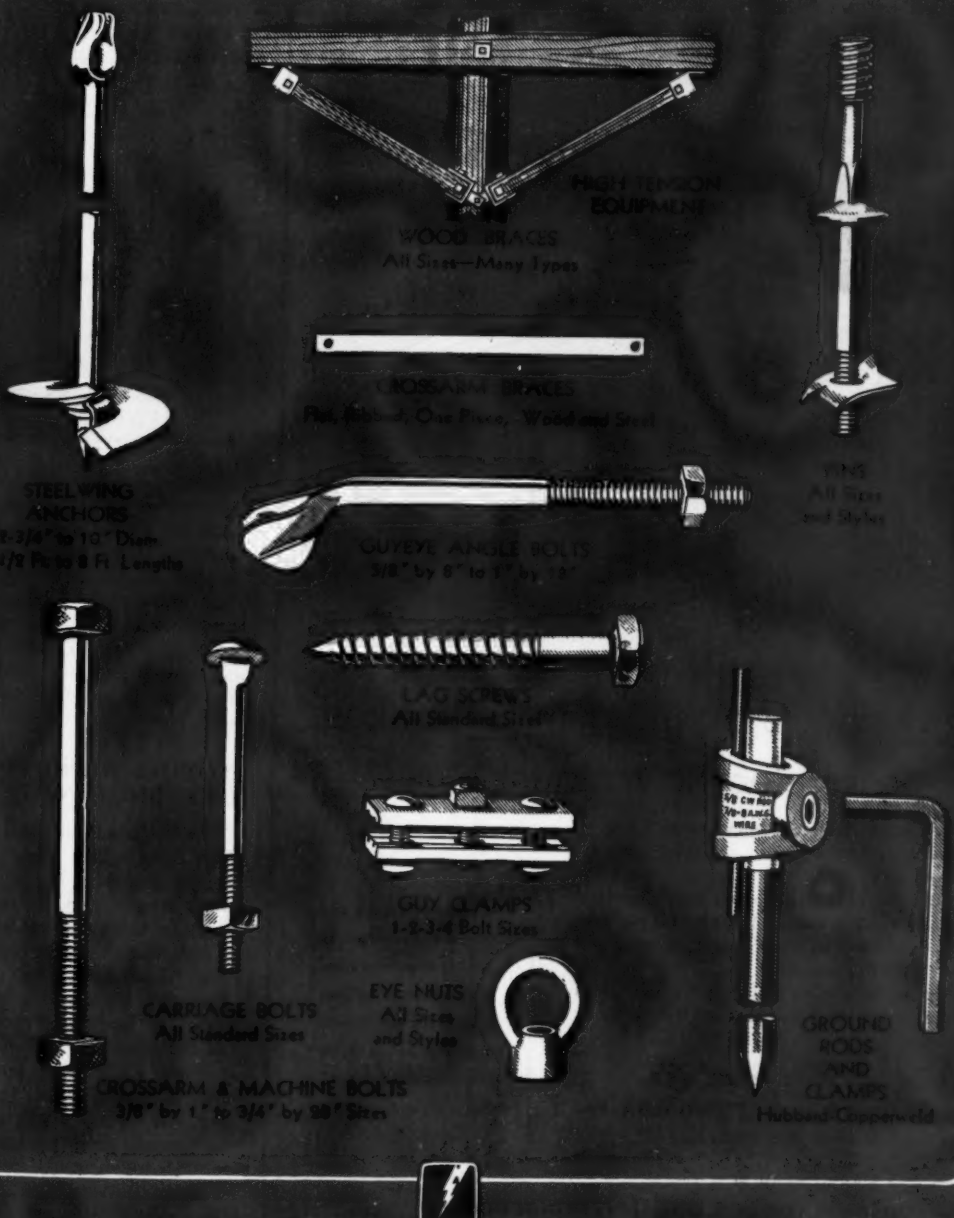
Lamp manufacturers have announced that they are developing, as fast as possible, Slimline fluorescent lamps suitable for use on series circuits.

The lamp and its socket are being designed together as in the case of the multiple lamp development. Included in the advantages created are maximum utility, safety and appearance as well as even nominal lengths (one lamp plus two series sockets) of, for example, 96 and 72 inches.

Type or types of Slimline lamps to be offered for series circuit operation are being carefully studied. It is expected that both hot and cold cathode types will be made available.

1945 CONSTRUCTION

"Hang the Load on Hubbard Hardware!"



HUBBARD AND COMPANY

Pittsburgh • Chicago • Oakland, California

THERE'S ONLY ONE MOVING PART IN
Federal NOARK
MAGNETIC MOTOR STARTERS
and that part moves on BALL BEARINGS!
Get that? Ball bearing action! The biggest single feature in starters and contactors—and you'll find it exclusively in Federal Noark Controls. You'll find the bearings smoothly, quickly and accurately locating and guiding the entire assembly. You'll find friction (always present where there is motion) reduced to an extremely low point. Study the illustration carefully. This is only ONE of Federal's many superior features. Contact your local Federal Field Engineer. He'll show you this and many other exclusive features of Federal Noark Controls. Do it today!
FEDERAL ELECTRIC PRODUCTS COMPANY, INC.
Executive Office: 50 Paris Street, Newark 5, New Jersey • Plants: Hartford, Connecticut; Newark, New Jersey
Manufacturers of Motor Controls • Safety Switches • Circuit Breakers • Service Equipment • Panelboards
BALL BEARINGS
The section in red represents the only moving part of the Federal Noark Magnetic Motor Starter. Simplicity itself!

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The pioneer production will be concentrated in mercury vapor and gas filled rectifiers. These items are extensively used by the automotive trade on battery chargers, as well as by theater supply houses, electrical distributors, and electronic radio jobbers.

SLIMLINE LAMPS FOR SERIES CIRCUITS

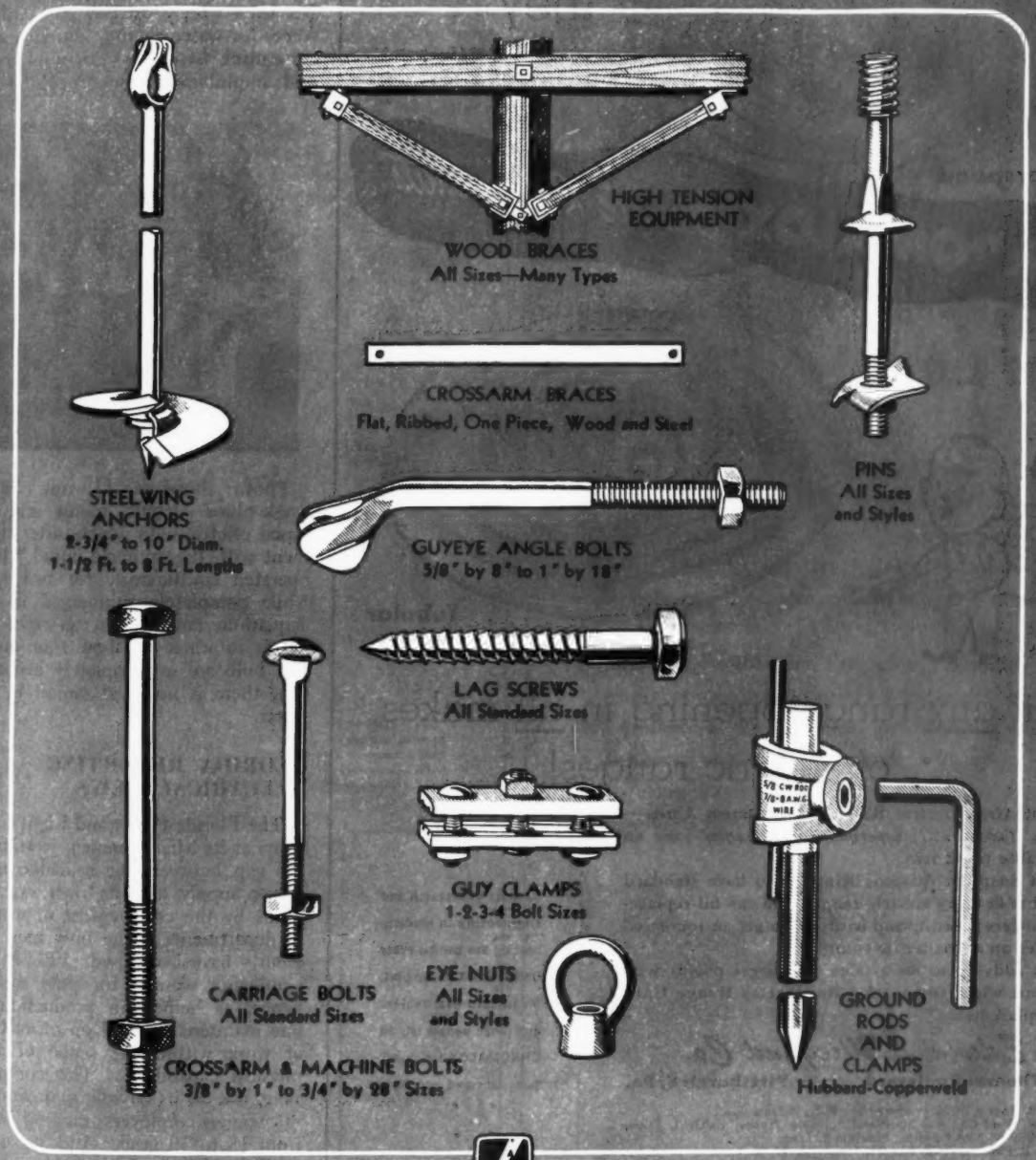
Lamp manufacturers have announced that they are developing, as fast as possible, Slimline fluorescent lamps suitable for use on series circuits.

The lamp and its socket are being designed together as in the case of the multiple lamp development. Included in the advantages created are maximum utility, safety and appearance as well as even nominal lengths (one lamp plus two series sockets) of, for example, 96 and 72 inches.

Type or types of Slimline lamps to be offered for series circuit operation are being carefully studied. It is expected that both hot and cold cathode types will be made available.

1945 CONSTRUCTION

"Hang the Load on Hubbard Hardware!"



HUBBARD

HUBBARD AND COMPANY

Pittsburgh • Chicago • Oakland, California

Fit any range opening in all makes of electric ranges!

CHROMALOX *Electric* Range Replacement Units—famous *Tubulars* . . . *Superspeeds* . . . *Heatflos*—are an unbeatable profit trio.

With Snap-On Adaptor Rings—you have standard units that fit every electric range. You can fill replacement orders speedily and easily. You get an increased turnover on a smaller inventory.

This adds up to *more* sales and *bigger* profits with *less* effort when you stock CHROMALOX Range Units for Replacements.

30 years of research and engineering in electric heating are behind every CHROMALOX Range Unit. Manufacturers, dealers and range owners rely on CHROMALOX for speed, Long Life and Economy.

Edwin L. Wiegand Co.

7600 Thomas Boulevard Pittsburgh 8, Pa.

C. B. Rogers, 1000 Peachtree St., N.E., Atlanta, Ga.
L. R. Ward Co., 403 Southland Building Annex, Dallas 1, Texas
939 M & M Building, Houston 2, Texas
W. R. Phillips, P. O. Box 2561, Raleigh, N. C.

on new ranges and for replacements

CHROMALOX
"Electric Cooking at its Best!"

RC-7

WATERPROOFING LIQUID RELEASED TO PUBLIC

A revolutionary waterproofing liquid for electric motors, ignition systems, batteries, internal-combustion motors, wiring and numerous other devices subject to corrosion or affected by water or moisture, has just been released for civilian use by U. S. Industrial Chemicals, Inc. Known as "PiB," the liquid insulation product has been widely used by the armed forces for waterproofing ignitions and preventing battery corrosion of jeeps and amphibious vehicles.

Photo shows a 110-volt, ½-hp single-phase electric motor and exposed electric bulb which, after treatment with the "miracle liquid," have operated continuously for two years while completely submerged in the acquarium tank. Man on right has hands in water to show that motor and bulb are so completely insulated that there is no short circuit in the water.

FLORIDA REPORTING ELECTRICAL NEWS

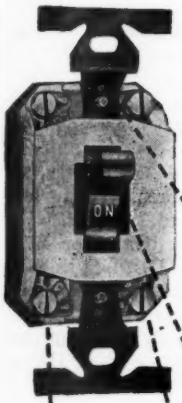
The Florida Power and Light Company, at its Miami branch, is bridging the gap between the available manpower supply and its own essential needs by the employment of women in departments where only men previously have been used. FPL is now employing women for pole maintenance, as helpers in production, in line maintenance, and on other types of work within the scope of their physical capabilities. The company, now, has on its payroll approximately 40 women employees, ranging in age from 18 to 50 years. And, according to D. L. Bosworth, branch manager, the arrangement has proven to be highly satisfactory.

* * *

Norton R. Ganger, air-conditioning and refrigeration equipment distributor and dealer, Miami, Fla., is ready

FOR DEPENDABLE GENERAL SERVICE

USE BRYANT 3951 LINE OF SWITCHES



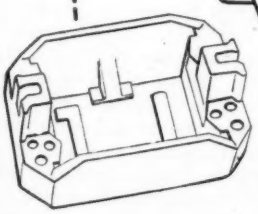
For general service you want switches you can trust. The Bryant 3951 line of flush tumbler switches has been thoroughly proved under all conditions in millions of installations.

"T" rated at 10 amps, 125 volts—5 amps, 250 volts. Available in single-pole, double-pole, three-way and four-way types. Handles are brown or ivory, lock or momentary contact types.

Heavy steel yoke, protected against corrosion. Ears scored for easy break-off.

Trouble-free, long life assured by quick-acting arc-resisting mechanism.

Contacts with adequate terminal screws arranged for easy top-wiring.



White porcelain shallow cup permits installation in shallow-type boxes.

Specify Bryant Devices from your Electrical Wholesaler

THE BRYANT ELECTRIC COMPANY

SUPERIOR WIRING DEVICES

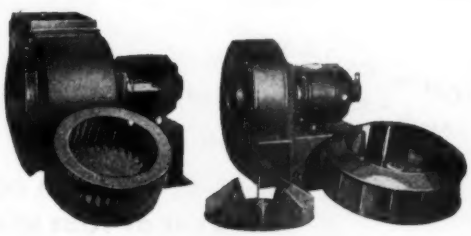
BRIDGEPORT 2, CONNECTICUT

NEW YORK SAN FRANCISCO CHICAGO LOS ANGELES

Climate AS YOU LIKE IT

THAT'S the story behind Johnson's Health-aire propeller fans and blowers. The cumulative "know-how" growing out of more than twenty-five years of constant research and experiment back every one of these products.

Johnson Health-aire Propeller Fans and Blowers of various types are now available for industrial and commercial users. Let a Johnson engineer help you solve your ventilating problems . . . his counsel is available to you at all times.



Healthaire

JOHNSON FAN & BLOWER CORP.

H. C. BIGLIN, 177 HARRIS ST., N. W., ATLANTA 3, GA.

BIG NEWS

T-K REPLACEMENT UNITS AVAILABLE NOW TO FIT ANY MAKE ELECTRIC RANGE

Here's news that will bring smiles of happiness to Housewives who own Electric Ranges. Now—Mr. Dealer, you can replace every burned out unit with the famous T-K replacement unit assuring long life, economy and trouble proof operation.

THE FUTURE'S BRIGHT FOR T-K DEALERS

Get on the T-K bandwagon now. Stock T-K products—sell quality—make loyal friends. Your T-K distributor will help you.

MAIL COUPON NOW FOR NAME OF YOUR NEAREST DISTRIBUTOR

TUTTLE & KIFT INC.

1825 North Monitor Avenue • Chicago 39, Illinois

Gentlemen: Please send me name and address of nearest T-K distributor. No obligation.

☐ Please send Catalog and Service Manual No. 8

FIRM NAME_____

ADDRESS_____ CITY_____

ing his operation for the handling of an anticipated increase in business volume. To this end he has completed, recently, the erection of a new 50-ft.-by-120-ft. concrete - and - steel structure to house his servicing and engineering facilities, and to provide additional warehousing space. Ganger distributes Westinghouse air-conditioning and refrigeration apparatus in Central and South Florida, except Tampa territory. He has, also, state coverage for Vilter ice-making machinery. And his operation includes installation, as well as sales.

* * *

John C. Madden and John L. Meyer, who have operated Florida Appliance Service at Miami, Fla., for the past several years, recently sold out their business to Irving B. Coleton and I. A. Feinstein. The latter is owner of Magee Distributors, Boston (Mass.) electrical appliance wholesaling firm. Coleton is an electrical engineer, and formerly was connected with the Detroit Vapor Stove Div. of Borg-Warner.

The new owners have changed the trade style of the concern to Florida Appliance Sales and Service Company, and their plans include the remodeling of the quarters, now occupied by the business, for the merchandising of major and minor electrical appliances. Servicing facilities are to be expanded, and will be divided into two sections: domestic and commercial. Madden will remain, as domestic appliance service manager. Meyer will head the commercial appliance section.

* * *

The Associated Radio Company, radio store chain, operated by Welburn Guernsey, recently has changed its trade name to Associated Stores. It has, also, broadened its merchandising coverage to include the sale of electrical appliances. Selling activities will be under the direction of H. A. Brennan, former WPB head for the Tampa-Miami district, who recently became connected with the concern as its general manager. Before coming to Florida, Brennan was an electrical appliance distributor in New York City. To his chain of five Florida stores, Guernsey, recently added still another location—Miami.

The Jarvis Appliance Co., 203 Beech Street, Newport, Ark., is installing a complete new glass front to its building and making other improvements.

Eugene and Noble Jarvis started in the electrical appliance and electrical supply field January 1, 1945.

"RACO? RACO? wonder if teacher knows?"

• Maybe not, honey, but electrical contractors, architects and builders the country over DO know that it's the trademark for the Raco•All-Steel•Line of Switch Boxes, Outlet Boxes and Fittings.

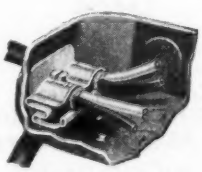
WHY RACO IS YOUR "BEST BET"

It's *clean*—There's always a smooth, lustrous finish on Raco•All-Steel•Products. No jagged or rough edges. No dirt or grease.

It's *packaged*—The Raco line comes to you in good-looking, neat cartons . . . cartons that have a readable index showing product number, quantity and finish.

It's *uniform*—The same exacting standards are used in the Raco line that have been outstanding in All-Steel's precision metal products for over 32 years.

Also, *Raco•All-Steel* is *sold nationally* through *wholesalers only*. It's the quality line, your dependable line. Look for the Raco trademark . . . your sign of better workmanship.



DO-21-N-3 3½" dia.
DO-16-N-3 4" dia.

Use Raco clamp type boxes to solve many of your connector worries.

DO-21-N-3, 3½" dia. is widely used with non-metallic cable.

DO-30-N, 3½" dia. is the perfect box for use with "BX."

ALL-STEEL-EQUIP COMPANY, INC.
8[illegible] Kensington Avenue, Aurora, Illinois

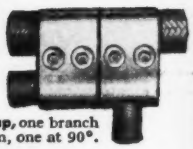
DO-30-N 3½" dia.
DO-31-N 4" dia.

RACO • ALL-STEEL • PRODUCTS
SWITCH BOXES • OUTLET BOXES

It's Easy to pick the right CABLE TAP— from the *Complete* line

You'll find the widest variety of parallel and 90° taps, combinations, and gutter taps—in a range of sizes up to 1,000,000 cm. Insulating Bakelite covers can be furnished for all types.

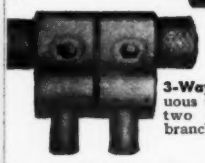
Single 90° Tap from main conductor.



ombination Tap, one branch arallel to main, one at 90°.

2-Way Gutter Tap.

akelite Covers an be furnished or all types of enn-Union cable aps.



3-Way; continuous main and two separate branches.

lso a complete line of Service Conectors, Terminals, Tees, Straight nd Parallel Connectors, Grounding onnectors, etc.—every good type of nductor fitting. And every one is curately made, thoroughly tested dependable.

L. MORRIS LANDERS
15 Walton Bldg. ATLANTA, GA.
WALTER J. HUEMMER
allas Transfer & Terminal arehouse Bldg. Dallas, Tex.
ENN-UNION ELECTRIC CORPORATION
Erie, Pa.

PENN-UNION
Conductor Fittings

PERSONAL NOTES
About Men You Know

After an absence of two years, Joseph **Whitner** has returned to the engineering department of the Southeastern Underwriters Association. Mr. Whitner was formerly assistant chief engineer of the association, but left the organization two years ago to engage in a local agency insurance business. Mr. Whitner is well known among electrical people in the South, having served as secretary of the Southern Section, International Association of Electrical Inspectors, for a number of years. The resumption of his former activities in the electrical field will again bring him in close contact with his former associates.

* * *

R. M. Oliver, vice-president of the Proctor Electric Company, of Philadelphia, manufacturer of the famous Never-Lift iron and other electrical household appliances announces the appointment of **Wesley R. Edmondson** as Dallas district manager for the company.

Mr. Edmondson has been associated with the Proctor Electric Company since 1939. In March of 1942, he took a war-time leave from the company to join the Todd Houston Shipbuilding Corp., at Houston, Texas. Upon completion of the Liberty Ship contract held by the Todd Houston Shipbuilding Corp., Mr. Edmondson rejoined the Proctor Electric Co.

W. R. Edmondson

* * *

Frank M. Oglee has been appointed district manager of the Atlantic District for the Trumbull Electric Mfg. Co., which now includes Maryland, Virginia and the District of Columbia; other than Government.

Frank E. Cline has joined the ranks of Trumbull salesmen for the state of Virginia, with headquarters in Norfolk, Va. Mr. Cline was previously associated with the General Electric Supply Corp. and previous to coming with Trumbull was active in the contracting field.

William J. Batchler has been relieved of his assignment as district manager for Virginia, Maryland and the District of Columbia, and has been appointed as director of Government sales. Mr. Batchler resides in Baltimore, although he will devote the greater majority of his time to Washington activities.

George L. Stout has been appointed district manager of a new East Cen-

HELWIG SPEER
Carbon Products

Multiflex Brushes
Give
Better Commutation
Longer Life
Less Commutator Wear
That Extra Demand Required
Better All Around Performance
KEEP THE BONDS YOU BUY

HELWIG COMPANY
2544 NORTH 30th ST., MILWAUKEE 10, WIS.
Southern Offices:
323 Northwest Second St.,
Oklahoma City 2, Oklahoma
3000 Block McKinney, Houston 3, Texas
1913 Washington Avenue, St. Louis 3, Missouri

G-E Irons are on the way

Available Now—Two Fully Automatic "Dial-The-Fabric" Irons
Coming Soon—A Fully Automatic Steam Iron and a Travel Iron

You'll want to stock all four of the Irons in the General Electric line!

You know how a full line can help you get those *extra* sales! It gives your customers a *selection* of models for every ironing need . . . at a range of prices for every pocketbook!

And it gives *you* a swell chance to *sell up* to better qualities . . . building bigger dollar volume!

Your customers will want G-E!

A recent national survey asked: "If Irons were available now, which brand would you buy?"

General Electric was first choice by more than 2 to 1 over the next most popular brand!

That's proof of popularity that will give G-E Irons, and *G-E Dealers*, a big head start in the postwar market.

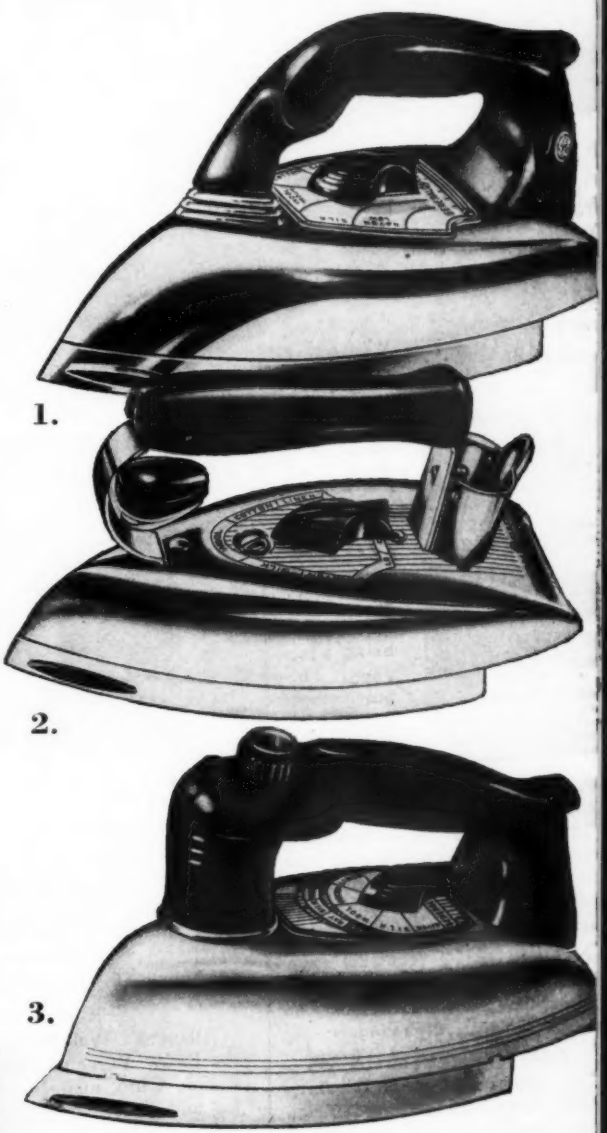
Build your plans around the complete line of these famous irons. General Electric Co., Appliance and Merchandise Department, Bridgeport, Conn.

Only G-E Fully Automatic, "Dial-The-Fabric" Irons Have All These Features!

- **Famous Calrod Heating Unit**
- **G-E "Dial-The-Fabric" Heat Selector**
- **Fully Automatic—constant heat maintained**
- **Button Nooks—for ironing under buttons**
- **Thumb Rest—to relieve muscle strain**
- **Lightweight Design—cuts ironing fatigue**

1. **Fully Automatic Streamlined Iron . . . $8.55.** Available now in limited quantities. Has all the G-E features for fast, easy ironing.
2. **Fully Automatic Iron . . . $5.70.** Biggest iron value in its price class. All G-E features. Available now in limited quantities.
3. **Fully Automatic Steam Iron . . . $16.20.** All the G-E features, plus steam ironing! Can be switched from steam to dry ironing at any time.

Lightweight Folding Travel Iron . . . $5.70. Weighs only two pounds, handle folds against sole plate top for easy packing. Has heat indicator.



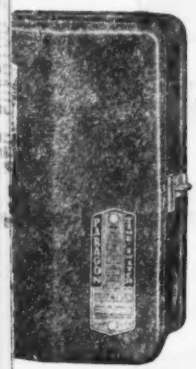
FOR GOOD LISTENING: Don't miss Art Linkletter, in "The G-E House Party," every afternoon, Monday through Friday, 4 p. m., E.W.T., CBS. "The G-E All-Girl Orchestra," Sunday, 10 p. m., E.W.T., NBC. "The World Today," News, Monday through Friday, 6:45 p. m., E. W. T., CBS.

FOR FINAL VICTORY—BUY AND HOLD MORE WAR BONDS

THE APPLIANCES MOST WOMEN WANT MOST

GENERAL ELECTRIC

NOW!
Telechron
MOTORS
are used on
Paragon
300
SERIES
ME SWITCHES



● Telechron motors now bring a further improvement to Paragon 300 time switches ... accurate, d, dependable units for controlling commercial lights, attic fans, stokers, ners, blowers, pumps, valves, motors, otor and gear train sealed to exclude id dust. Two bearing plate construc- Lower power consumption. Sealed- reservoir. Other important features.

NO PRIORITY NEEDED
nment restrictions have been re- from time switches. They may be ased without priority rating.

E FOR NEW BULLETIN . . .
complete details on the Telechron d 300 series built by an organization ineers and skilled craftsmen special- n electrical equipment since 1905.

GON ELECTRIC COMPANY
ld Colony Building • Chicago 5, Ill.

Paragon Chicago
ERS OF ELECTRICAL EQUIPMENT SINCE 1905

tral District, with headquarters at the Trumbull factory in Norwood, Ohio. Mr. Stout was formerly district manager located in Cleveland, Ohio, which will be included in the new territory.

* * *

R. C. (Swede) Norene is the newest addition to the staff of the Southeastern district office of the National Electrical Products, according to announcement by **W. E. Henry Jr.**, Southeastern district manager. Mr. Norene joined the organization on July 1 and will serve as office and warehouse manager, with headquarters at Atlanta. He was formerly associated with the General Electric Supply Company at Charlotte, having served as service manager from 1925 to 1940 and as operating manager since 1940.

* * *

J. W. Derr has been appointed regional manager for the southern district of the American Central Manufacturing Corporation, it is announced by **C. Fred Hastings**, general sales manager of the company.

J. W. Derr

Mr. Derr was field representative for the San Diego division of Consolidated Vultee Aircraft Corporation prior to his joining American Central at Connersville, Indiana. He will make his sales headquarters in Atlanta, Ga.

* * *

Albert F. Wakefield, president of the F. W. Wakefield Brass Co., Vermilion, Ohio, manufacturers of lighting and signalling equipment for the navy, has been elected president of the Illuminating Engineering Society, it was announced by Society headquarters recently. Mr. Wakefield will take office October 1.

Mr. Wakefield has been active in the Society for over 25 years, serving on numerous non-technical committees of I.E.S. before his election to vice-president in 1943.

G. E. Mullin, Jr., has been appointed manager of the farm sales division of General Electric's appliance and merchandise department, **C. R. Pritchard**, general sales manager, announces.

Mr. Mullin's experience in the farm field has been extensive since joining General Electric in 1925. From 1936 to 1939 he was in the company's rural electrification, electrical contractor and educational sections in Schenectady. From 1940 to 1942 he was manager of the farm sales section.

When war came he was appointed assistant supervisor of inspection of the appliance divisions, and later was quality control engineer at the Lowell, Mass., launcher plant.

* * *

Charles L. Hobbs has been appointed assistant general sales manager of Faraday Electric Corporation. For the past year and a half, Mr. Hobbs has acted in the capacity of Chicago branch manager. Previous to his association with Faraday, he was vice-president of R. Cooper, Jr., Inc., appliance distributors, also of Chicago, where he spent 13 years. Mr. Hobbs will make his headquarters at 11 South LaSalle Street, Chicago.

ILSCO
Electrical Connectors

No, we don't ship ILSCO CONNECTORS in fancy jewel cases. Nor do we make them from castings which are heavy, costly and of poor conductivity when compared to the pure 99.99% electrolytic copper of 100% conductivity used in all ILSCO CONNECTORS.
Remember—it isn't weight that counts . . . it's conductivity!
Write for 32-page illustrated catalog.
Southeastern Representative
VERLYN H. BRANHAM
180 Interlochen Drive, N. W.
Phone CHerokee 5256
ATLANTA, GA.

ILSCO COPPER TUBE & PRODUCTS, Inc.
CINCINNATI, OHIO

Jim Pease

It has been announced that **Jim Pease**, advertising manager, and **Frank J. Simpson**, assistant sales manager, were elected vice-presidents of the

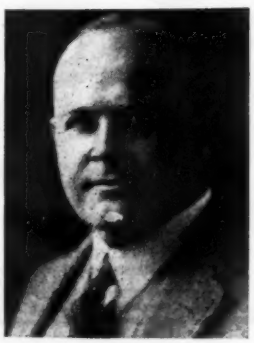
Frank J. Simpson

Hurley Machine Division of Electric Household Utilities Corporation at the annual stockholders' meeting held in May. All other officers were re-elected.

* * *

The appointment of **Frank C. Barrington** as Florida District manager has been announced by **Robert M. Oliver**, vice-president in charge of sales of the Proctor Electric Company, manufacturers of the Never-Lift iron and other small electrical appliances.

Mr. Barrington has been associated



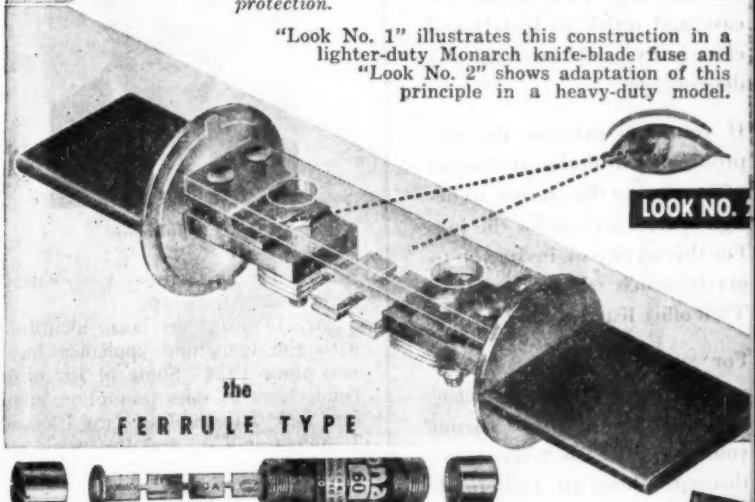
Frank C. Barrington

Take a TWO-WAY LOOK
AT THE
Monarch Fuse

the MONARC
SUPPORTIN
BRIDGE

Note how this Monarch construction prevents the fibre bar from coming in direct contact with the screw connecting renewal link to knife blade. This minimizes the charring of the fibre bar and positively prevents excessive overheating of knife blades. Note also large metal parts which dissipate heat. Result: *dependable protection.*

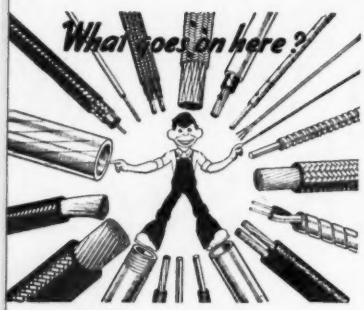
"Look No. 1" illustrates this construction in a lighter-duty Monarch knife-blade fuse and "Look No. 2" shows adaptation of this principle in a heavy-duty model.



the
FERRULE TYPE

Specify Monarch Fuses
for improved
FUSErvice

MONARCH FUSE CO., LTD.
118 E. FIRST ST., JAMESTOWN, N. Y.



EVERYTHING THAT T&B MAKES GOES ON HERE

For every possible kind of post-war hook-up for every type and size of wire and cable, and their raceways, T&B specializes in the fittings you require.

If your construction or production line job presents no unusual wiring problems, you will find standard T&B fittings are easy and quick to install and electrically and mechanically dependable.

If your job presents unusual problems, our design specialists will welcome the chance to design special fittings for the job. For this service we invite you to get in touch with our nearest T&B office listed below.

For supplies of T&B standard or special quality electrical fittings kindly order from your nearby T&B Wholesalers through whom all T&B products are distributed exclusively.

The Thomas & Betts Co.,
Incorporated
Room 423
Citizens & Southern Bldg.
Atlanta 3, Ga.

The Thomas & Betts Co.,
Incorporated
P. O. Box 2372
Charlotte, North Carolina

The Thomas & Betts Co.,
Incorporated
518 Masonic Temple Bldg.
New Orleans 12, La.

T&B
THE THOMAS & BETTS CO.
INCORPORATED
manufacturers of electrical fittings since 1898
ELIZABETH, 1, NEW JERSEY
In Canada: Thomas & Betts Ltd., Montreal

with the electrical industry for many years, starting at the age of seventeen when he organized the Columbian Electrical Company. His most recent association was with the Westinghouse Electric Corp. as manager of the Eastern-Central District of the Lamp Division.

Mr. Barrington will make his headquarters in Miami, Florida, and will work directly under Major Oswald MacCarthy recently appointed Eastern salesmanager for the company.

* * *

Appointment of **Sidney E. Johnson,** of Atlanta, Ga., as Southern regional manager in the sales department of the manufacturing division of The Crosley Corporation, was made recently by **James H. Rasmussen,** Crosley general sales manager.

Mr. Johnson succeeds **Syd D. Camper,** who has resigned to become distributor for The Crosley Corporation in Jackson, Mississippi.

S. E. Johnson

Mr. Johnson has been identified with the household appliance business since 1924. Some of his prior connections as sales promotion manager were with the Cleveland Electric Illuminating Co., and the Frigidaire division of General Motors in their Cleveland district.

* * *

James M. LaVier, Jr., has joined the staff of Sylvania Electric as sales representative serving the Virginia territory with headquarters at Richmond. Early in 1941 he began active duty in the U. S. army with the rank of Captain and later served overseas in North Africa and Sardinia before being reverted to inactive duty in May of this year with the rank of Major. He is a graduate of the Virginia Polytechnic Institute where he received a degree in electrical engineering in 1932. Between 1933 and the time he joined the armed forces he was with the Virginia Electric and Power Company.

Charles R. Horrell, vice-president and general sales manager of the Sangamo Electric Company, Springfield, Illinois, passed on while at work on July 5.

Mr. Horrell, who was 56 years of age, held a degree in electrical engineering, University of Illinois, and was a member of the American Institute of Electrical Engineers. After several years with the Electric Appliance Company, of Chicago, he became sales manager of the Sangamo Electric Company, in 1919, and was appointed vice-president in 1941. Mr. Horrell was well known as an electrical meter engineer, and had a wide acquaintanceship among electric utility officials throughout the country.

* * *

Forrest A. Robertson, sales manager of Robertson Supply Company, wholesale distributors of electrical appliances and commercial lighting fixtures, of Orlando, Fla., died in Orlando on June 11. Mr. Robertson had been sales manager of the company for more than 15 years. Prior to that, he had been a manufacturers' representative with headquarters in Birmingham, Ala., for more than 20 years.

FOLDING **DOUBLE** CUPPED
★ WASHER LUGS ★
A SIZE and TYPE *for every need!*

NO SPECIAL TOOL REQUIRED

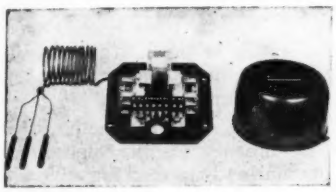
K&H
WRITE FOR BULLETIN 8-DF
KRUEGER & HUDEPOHL
Solderless Terminal Lugs and Connectors
VINE AT THIRD—E.S. • CINCINNATI 2, OHIO

New Electrical Products

NEW THERMAL RELAY

A new winding-temperature relay, which permits utilization of the maximum permissible emergency-overload capacity of power transformers under all ambient temperature conditions, has been announced by General Electric's Transformer Division.

This equipment operates from a combination of top oil temperature, ambient temperature, and load current, and thus enables winding hot-spot temperatures to be limited to values recommended by industry



standards. The relay has three separate contacts, which close in sequence as the winding temperature increases. On a transformer with cooling fans for supplementary rating, the relay can perform the following operations:

1. Start cooling fans as soon as the self-cooled, load-carrying capacity of the transformer is exceeded.
2. Give a warning signal as soon as overload has been on for the permissible length of time.
3. Sound an alarm or trip the circuit breaker, taking the transformer off the circuit when the overload exceeds specified limits.

The relay, which is mounted on the outside of the transformer tank at a convenient working height, can be easily checked in the field without interrupting the load on the transformer. It is self-compensating for ambient temperature.

POWER FACTOR BOOKLET

"The A. B. C. of Power Factor," a new 20-page fact-filled booklet that explains power factor in detail, has been published by Electric Machinery Manufacturing Company.

It is well illustrated, fully authentic, and printed in three colors. Partial contents include: What Is Power Factor, Why Low Power Factor Is Detrimental, How to Get High Power Factor, and How to Make Power Factor Calculations.

For further information, write Electric Machinery Mfg. Co., East Minneapolis 13, Minn.

You can't be seen going to the office like this!
But chances are you've favored the idea on sweltering summer days. Your employees have, too. But since convention shakes its head, the next best thing is plenty of cooling, moving air—the kind you get from large-air-volume, quiet-running Robbins & Myers Fans.
In the factory, too, you can prevent "summer slow-down." For suitably placed R & M Fans provide *properly engineered air circulation* over wide areas, keep your workers on their toes, cost next to nothing to operate, are a breeze to service.
If you're fortunate enough to have some of these R & M energy-savers, it would be well to have them checked, cleaned, and oiled before the mercury gets up out of sight.
If you need a fan of any kind, we'll be glad to send you complete information about R & M Fans as soon as WPB permits us to manufacture them for other than essential industrial use. R & M also manufactures electric motors, pumps, hoists, and cranes.
Available only for essential industrial use
ROBBINS & MYERS · INC. SPRINGFIELD, OHIO
In Canada: Robbins & Myers Co. of Canada, Ltd., Brantford, Ontario

HOT TIP This hot-off-the-press Robbins & Myers ad avoids promoting ill will among fan customers by making it clear that you haven't any R & M Fans for other than *essential industrial application.* It makes no bones, either, about the fact that we, and you, would like to get a line *now* on the non-industrial folks whose needs can be served when WPB gives the go-ahead.

MODERN ILLUMINATION

FLUORESCENT

G·G·G

INCANDESCENT

Our Engineering and Designing Staff For All Needs in Lighting at Your Disposal

GRUBER BROTHERS

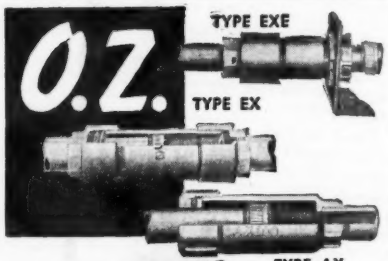
Holophane Licensee

Fleur-O-Lier Manufacturers

Write for Our Descriptive Bulletins

Showrooms and Factory

72-78 Spring St., New York 12, N. Y.



EXPANSION FITTINGS

To compensate for the expansion and contraction of conduits terminating in a junction box, specify O. Z. Type "EXE".

For continuous runs of conduit provide for expansion and contraction by specifying O. Z. Type "EX". Expansion head is sealed against moisture by high grade packing. Interior Bakelite bushings prevent abrasion of cables.

Where a shorter and more compact fitting is required specify Type "AX" which incorporates the principles of the Type "EX" but has fewer parts.

For thin wall conduit (EMT) use our Type "TX". This is the same as the Type "AX" fitting except that it has extending nipples for attaching to thin wall couplings.

O. Z. ELECTRICAL PRODUCTS

- CONDUIT FITTINGS
- CABLE TERMINATORS
- JUNCTION BOXES
- SOLDERLESS CONNECTORS
- GROUNDING DEVICES
- POWER CONNECTORS

O.Z ELECTRICAL MFG. CO.

262 BOND STREET · BROOKLYN, 2 N. Y.

Represented by

M. L. WHITMAN . . . . . 313 Bona Allen Bldg., Atlanta 3, Ga.
W. J. KELLER . . . . . 304 Natchez Bldg., New Orleans 12, La.
F. B. OSTERMUELLER . . 6935 Meadow Lake Ave., Dallas 14, Texas

8144

COLD STORAGE FAN

The Chelsea Fan & Blower Company, Irvington, New Jersey, has just issued a complete catalog, showing all the postwar equipment they are manufacturing, including their utility type fan, especially designed for cold storage, meat packers, and freezers.

This fan is so constructed that it will operate in temperatures as low as

25° below zero, up to extreme heats such as is found in chemical plants and laundries, and even in the presence of live steam.

The utility fan is totally enclosed, equipped with ball bearing motors with front and rear guard, and so constructed that it can be operated in any position desired. Copies of this catalog will be mailed upon request to all parties interested in this line of equipment.

STOP WATCH BULLETIN

The Herman H. Sticht Co., Inc., of 27 Park Place, New York 7, N. Y., has just issued a new bulletin, No. 575, covering imported stop watches of the 1/5 second type and also of the decimal timers which divides the minutes into 100 parts.

ELECTRONICS BOOKLET

To provide an understanding of the principles of electronics and an idea of the part electronics will play in future industrial developments, a 20-page book entitled, "Introduction to Electronics," has been produced by the Allis-Chalmers Mfg. Co. The new educational bulletin was prepared by Dr. Walther Richter, recognized as one of the outstanding engineers in this promising electrical field.

A brief discussion on the fundamentals of conversion and control of electric power in a load prefaces introduction of the subject of electron tubes. Approaching this subject as a guide for application engineers, instead of tube designers, the book explains that the electron tube is a new control element which is nothing but a special type of rheostat or switch. The discussion of tubes is divided into two main parts: vacuum and gaseous.

This booklet, E6358, is available upon request from the Allis-Chalmers Mfg. Co., 568, Milwaukee 1, Wis.

NEW LAMP HOLDER

Lloyd Products Company of Providence, R. I., has brought out a new fluorescent lamp holder which eliminates difficulties inherent in conventional holders and fixtures.

The "Flex-Loc" holder is flexible, adjusting automatically to variations in length of lamps and spacing of mounting holes in reflector units, and has a positive automatic lock which absolutely prevents lamp from falling out, or contacts from loosening, due to vibration or shock. The newly designed, patented contacts grip both sides of lamp pins.

Mounting of holder in the fixture is simplified also, the tapped hole in mounting bracket doing away with the need of mounting nuts. Flex-Loc does not call for changes in fixture layout. It is engineered to fit all standard spacings.

REST where it is COOL

HOTEL Mayfair ST. LOUIS

AIR-CONDITIONED

HYDENT CONNECTORS

Hydent electrical connectors for small-size aluminum wires and cables which are said to provide permanent, low-resistance connections have just been announced by Burndy Engineering Co., 107 Bruckner Blvd., New York 54, N. Y.

In the manufacture of these connectors, zinc is plated on oxide-free aluminum. This prohibits reformation of the oxide film once it has been removed, and provides the connector with low-resistance contact surface. The barrel of each connector is then filled with petrolatum jelly in which zinc dust is suspended. Thus, when the cable end is inserted into the zinc-filled barrel, zinc compound is forced in between the individual strands. Then as the connector is indented to the cable with the Burndy Hytool, the zinc particles tend to break through the oxide film on each strand as the wires are forced to rearrange themselves and wipe against

one another under the pressure of the indenting tool.

It is said that laboratory tests on these new connections show a relative conductivity of approximately double that of an ordinary aluminum connection. For example, the ordinary connection was found to have a conductivity of 59.8% of the I.A.C. Standard, while the zinc-plated, compound-filled connection had a conductivity of 117.5%.

FLUORESCENT LAMPHOLDER

A fluorescent lampholder known as the Twin Turret, entirely new in design and construction, which holds the lamp securely in contact, has been announced by the accessory equipment division of General Electric's appliance and merchandise department, Bridgeport, Conn.

The new lampholder is made for use with 40-watt lamps. It has a husky metal casing with insulated face and holds two Mazda F fluorescent lamps. Starter sockets are an integral part of the lampholder and are located between the lamps. They will accommodate either FS-40 G-E Watch Dog starters or conventional FS-4 starters.

ALL THREE CHOOSE G-E

Users of fluorescent lighting, engineers and maintenance men are improving their lighting service by switching to G-E Watch Dog Fluorescent Starters. These manual reset starters are providing efficient service and positive protection for 30-, 40- and 100-watt lamps in commercial and industrial installations all over the nation. Here are only a few of the many reasons why all three choose G-E.

You can get the complete story about G-E Watch Dog Starters by writing to Section G854-16, Appliance and Merchandise Department, General Electric Company, Bridgeport, Connecticut.

1.

Users are protected from annoying blink and flicker of dying fluorescent lamps once and for all. Blinking cannot possibly recur once the Watch Dog cuts out.

2.

Lighting Engineers specify G-E Watch Dog Starters because of their unusually long life. Under specified test conditions the FS-40 outlasts ten 40-watt fluorescent lamps.

3.

Maintenance Men prefer G-E because the Watch Dogs are loyal friends. They reduce lighting maintenance to the easy job of pushing a red button before relamping. Simply reset it . . . forget it.

BUY WAR BONDS AND KEEP THEM

GENERAL ELECTRIC

The new Twin Turret lampholder will eliminate the costly replacement of broken lampholders and will provide positive protection against lamps falling out of fixtures. Starters may be replaced without disturbing lamps.

Unique features of the Twin Turret lampholder include its easy mounting, the simplified wiring required and its new method of operation. The lampholder can be mounted on any flat surface with two screws, preferably with lock washers under the screw heads. Tinned and stripped leads can be inserted through entrance holes in the face of the lampholder. Binding screws can then be tightened through the holes in the bottom of the lampholder to make permanent pressure contacts.

TRANSPARENT TAPE

A transparent, flexible thermo-plastic tape, greatly facilitating inspection and servicing of equipment on which it is used, has been introduced by the Irvington Varnish and Insulator Company, Irvington, N. J.

Useful not only as electrical insulation, Fibron Tape No. 3 also protects wiring, cables, and equipment against abrasion. The tape is heat sealing, flame resistant, flexible at low temperatures, and resists attack by acids, alkalies, moisture, oil, grease and corrosive fumes. With proper adhesives, it may be bonded to fabrics, metal, ceramics, wood, and other materials.

Wave Windings For A-C Motors

(*Continued from page 38*)

number of slots under each SPP heading, such at 24, 36, 48, 60, 72, etc., in Table I under 2SPP, the back and front pitch will be the same or 1 and 7. This is an important relation to remember for it is a fundamental principle of the a-c wave winding that all windings having the same slots-per-pole-per-phase characteristic will have the same pitch, regardless of the number of poles or slots.

As the series progresses, we will provide a connecting diagram for each slot-per-pole-per-phase heading in Tables I and II, together with a lead grouping table and a checking table.

In the next article, we will start constructing a winding diagram to provide the fundamentals of a-c wave windings, and later show the evolution of the simple diagram from the present complicated winding diagram.

Maintaining Capacitors

(*Continued from page 30*)

dicates an abnormal voltage or harmonic condition which otherwise might be overlooked and reduce the life of the capacitor.

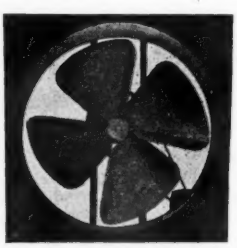
When a voltage-test set is not available, a test circuit, such as shown in Fig. 2, with suitable short-circuit protection, may be used. Apply rated 60-cycle voltage between short-circuited terminals and case of the capacitor. A current of a few milliamperes is normal because of a capacitance of less than 0.002 microfarad between terminals and case. Blowing of a fuse or tripping of a circuit breaker indicates a fault in the insulation.

A test circuit, as shown in Fig. 3, may be used in the absence of a regular test set. If the voltage is not readily variable, and if full-rated voltage is applied, the ammeter should be protected by a short-circuiting switch. After it has been established that no short circuit exists, this switch may be opened to read the current. Current readings may be interpreted as follows:

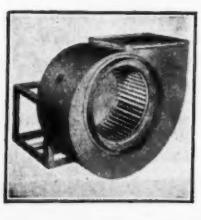
1. Excessive overload current that would cause the blowing of a fuse or

THE "*Fresh-Air* MAKER"

provides fully the comfort and ventilation so essential in army barracks, mess halls, hospitals, headquarters, theaters and other military buildings. Its fine design and sound construction meet the specifications drawn for army fans and it is particularly adaptable to the various types of installations found in army buildings.



HY-DUTY BLOWERS



Single Inlet—Double Inlet. 400 CFM to 12,500 CFM.

Single Inlet Blower illustrated at left is particularly adapted for ventilation of mess halls in military establishments.

VENTILATING DIVISION
SCHWITZER-CUMMINS COMPANY
1125 MASSACHUSETTS AVE. • INDIANAPOLIS 7, U. S. A.

PARTS
FOR
FANS
MOTORS
CONTROLS

PROMPT SHIPMENT FROM LARGE STOCKS

AUTHORIZED PARTS DISTRIBUTORS

Brown-Brockmeyer	General Electric	Master
Century	Hamilton-Beach	Peerless
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Emerson	Leland	Westinghouse
	Marathon	

READING ELECTRIC COMPANY, INC.
Parts Distributors for the Manufacturer
200 William St. *Barclay 7-6616* New York 8, N. Y.

tripping of a circuit breaker indicates a short-circuited capacitor.

2. Absence of current indicates an open circuit in the capacitor.

3. Normal current indicates that the capacitor is in good condition. (Normal current can be determined by dividing rated volt-amperes by rated voltage or from the formula

$$I = [6.28 \times f \times C \times E] / 1{,}000{,}000$$

where I is normal current, f is frequency, C is capacity in microfarads, and E is rated voltage.)

4. Current above normal indicates either that a series section in the capacitor is short-circuited or that harmonic voltages are present in the applied voltage. (Capacitors rated 1500 volts and above usually include two or more series sections.)

5. Current below normal indicates that a portion of the capacitor is open-circuited.

Electric Cable Cutter Saves Cutting Time

(Continued from page 24)

ing for mechanical and electrical safety, and a tension roller which prevents the cable from slipping or buckling while being cut. The entire device is assembled along a scale on a table. It could be used by contractors in making up standard "packages" of wiring materials, etc..

The solenoid control activates the levers which operate the cutter. The tension roller and the electric cable cutter, slot-mounted on an angular bracket, are not rigidly connected except by this bracket which runs the entire length of the scale. This arrangement permits varying the distance between roller and cutter or eliminating the use of the roller entirely to accommodate wire of different stiffness. The device is easily positioned by the operator, and it is locked by means of a thumb screw on the roller.

This method is faster and more accurate than the conventional method of cutting the wire with pliers. The operator had to draw the wire along the scale until the stop was reached, clamp the wire to hold it in position, and walk back to cut the wire at the proper point. The new method consists of threading the cable through the cutting hole and under the roller, drawing it to the desired length on the scale, and pressing the control button.

The control button is mounted on the cable cutter. However, the operating switch may be positioned anywhere on the scale by installing the switch at the end of a flexible lead.

"Conduit bending jobs taking three hours with old methods now are done in about 30 minutes with a GREENLEE Bender," says W. W. Huntress of Commonwealth Electrical Company, St. Paul.

"The GREENLEE operates easily," he also reports, "and is so portable that it can be used right on the job, in even the most unheard of places, and on a great variety of pipes."

This experience typifies that of the thousands who own GREENLEE Benders. You, too, can save greatly by using a GREENLEE . . . for *one-man*, precise bending of pipe up to 4½", rigid and *thin-wall* conduit, tubing, bus-bars.

Remember—whatever your bending job—there's a GREENLEE to do it faster, smoother, better! For facts on GREENLEE Hydraulic and Hand Benders and other tools to speed electrical work, write today for free Catalog 33E. Greenlee Tool Co., Division of Greenlee Bros. & Co., 1768 Columbia Avenue, Rockford, Illinois, U.S.A.

Special Notice: GREENLEE Electricians' Bits now available in 10, 11, 12-sixteenths sizes.

Get Ready with Greenlee!

REGISTERED TOOLS

GREENLEE

FOR THE CRAFTSMAN

KNOCK-OUT TOOLS Eliminate time spent on drilling and filing to enlarge holes. In 1½ minutes or less you can cut a hole up to 3½" with a GREENLEE Cutter or Punch. Just insert tool in a knock-out or small drilled hole, give a few turns of the drive nut with an ordinary wrench! For clean, round holes in bakelite, hard rubber or any metal up to ⅛" thick.

OTHER GREENLEE TIME-SAVING TOOLS FOR ELECTRICAL WORK

Hand Benders • Joist Borers • Cable Pullers • Radio Chassis Punches • Pipe Pushers

TEST EQUIPMENT CATALOG

A new bulletin F issued by the Shallcross Manufacturing Company, Collingdale, Penna., describes several forms of high-voltage test equipment. These include portable kilovoltmeters suitable for use from 1 to 30 kilovolts as well as the well known Shallcross Corona Protected Kilovoltmeters for measurements up to 200 kilovolts.

Separate kilovoltmeter multipliers are available for use with external meters for measurements from 1 to 30 kilovolts; Corona Protected Registers are available separately for use with suitable meters to permit measurements of potentials up to 200 kilovolts. A copy of the new bulletin F will be gladly sent upon request.

WAKEFIELD CATALOG

The F. W. Wakefield Brass Company, Vermilion, Ohio, has just issued Catalog No. 45, which is available to persons interested in office, drafting room, school, and store lighting equipment. The 28-page catalog contains engineering details for the layout of the incandescent and fluorescent lighting equipment illustrated.

Face Lifting for Store

(Continued from page 19)

and laundry equipment, they expect to hire a woman specialist. They will have one who understands all of the equipment so that she may be sent out to those who have purchased an item such as an automatic washer and show the owner how to get the most benefit out of it.

Sales of electric ironers have always been handicapped where adequate instruction was not provided and Jones & Gooding expect to avoid these pitfalls and see that all their customers get the very best instruction in the use of any equipment they buy. In addition to that, they are going to maintain an efficient 24-hour service department—a department which will know more about the equipment they are selling at the store than anyone else.

Featuring Strong Displays

(Continued from page 14)

plete stock we can possibly gather. There will be everything from electric egg beaters—a full line of minor appliances—to big window fans. There's a terrific New Orleans market waiting for those fans when they return, priority-free."

Magoni plans the use of heavy advertising as soon as he has stock. He knows that advertising won't be needed to sell appliances at first, but believes that he should begin building Barnett's as an appliance center in the public mind. "No time is too soon," he states.

"Advertising will be more to acquaint the public with lines we have than for anything else," he explains. "It's certain that no strong selling will be needed in those first few months!

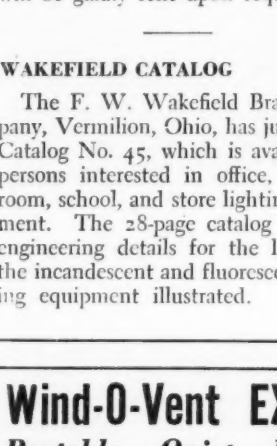
"Right now, we're taking customer 'priorities', listing them as they register for appliances. As the goods comes in, it will go to customers in the order of their listing. Already we've sold two or three to very happy accounts.

"We're careful with this to take no deposits and make no bona fide sales in advance. We merely list the customers' names, then when the merchandise arrives we call them in to buy. We avoid a lot of headaches that way.

"The list, typed, is displayed where

Wind-O-Vent EXHAUST FANS

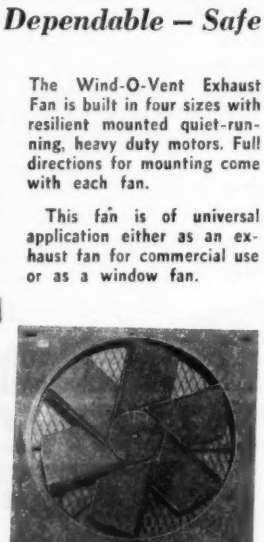
Portable – Quiet – Dependable – Safe



WOV-30 (Typical) Rear View

The Wind-O-Vent Exhaust Fan is built in four sizes with resilient mounted quiet-running, heavy duty motors. Full directions for mounting come with each fan.

This fan is of universal application either as an exhaust fan for commercial use or as a window fan.



Front View

CERTIFIED RATINGS

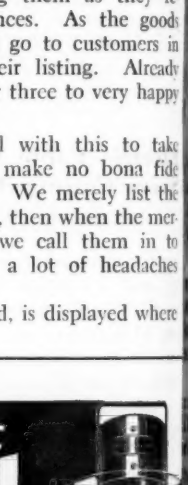
TEST STATEMENT—Each Reed Unit Fan bears a certified rating label of the Propeller Fan Manufacturers Association. This label certifies that the fan has been tested in strict accordance with the Standard Test Code as approved by the American Society of Heating and Ventilating Engineers.

REED UNIT-FANS, INC.

Manufacturers of Ventilating Equipment

1001 St. Charles Ave., New Orleans 8, La.

"Dixie-Maid" ELECTRIC **CHURN**



NOW AVAILABLE! Churns whole milk. Thumb screw adjustment. Slight pressure adjusts or releases dasher to fit any 3 to 5 gallon container. Slow-speed, long-life motor prevents overheating. Better agitation produces more butter faster. Improved rust-proof dasher. New splash-proof plate. Improved design eliminates vibration. Easy to clean. Costs few cents a month to operate. Sold through trade channels only. From your jobber, or order direct. (Containers not sold.) Manufactured and Guaranteed by

SOUTHERN ELECTRIC PRODUCTS, Anderson, S.

Connecting Diagrams for Lap-Wound Induction Motors

Every man concerned with motor rewinding will want a copy of this new publication by A. C. Roe which contains 72 modern connecting diagrams for induction motors of from 4 to 12 poles. The diagrams are arranged for dual voltage connections and best magnetic balance. A copy of this 132 page book is available with each 3-year subscription to Electrical South—total cost, $3. Write at once to

ELECTRICAL SOUTH

1020 Grant Bldg. Atlanta 3, Ga.

each customer can see it. Thus if Mrs. Jones believes that she should have the washer we just sold to Mrs. Smith, the list is available for her to check. We want each customer to be sure she's getting the squarest deal possible. Badly handled, a customer priority list could lead to much public ill will instead of the friendship it's meant to build."

Canvassing to Come Later

Until merchandise returns in a full stream, Magoni expects to do his appliance selling right on the floor. Door-to-door work won't be necessary —or even desirable, he believes, until he has a considerable surplus over the appliances customers coming into the store can buy.

"Before the war, we had an effective selling scheme," he relates. "Later, we'll go back to it. It kept the salesmen on their toes getting outside orders, and helped us do one of the biggest appliance dollar volumes in New Orleans, with one of the smallest sales staffs of any electrical house.

"Now, of course, we'll have every salesman on the floor. But when the appliances are plentiful enough to plug for outside sales, we're going after them as hard as we can."

The plan, which enabled six salesmen to mark up one of the greatest selling records in the Crescent City, entailed a priority system for salesmen's floor days.

"On the floor, a salesman could make as high as $200 a day," Magoni illustrated. "Monday was the big day, following our Sunday double truck ads, and I've often seen $50 offered for a Monday floor day by one salesman to another whose turn it was. And I've seen $50 refused, too.

"To get one of these commission-rich floor days, our salesmen worked to deserve them. Each rated a day a week on the floor—provided he sold a certain figure on his other days. Thus each would strive to turn in the best possible selling record to secure these fat days.

"If a salesman missed his quota however, he had to spend two weeks soliciting on the outside, turning in the minimum sales figure each week. If he turned in an outstanding selling record, he rated an extra floor day vacated by one of the unsuccessful salesmen. They kept hopping to rate their floor days. Our strong, consistent advertising guaranteed that every floor day would be a bonanza."

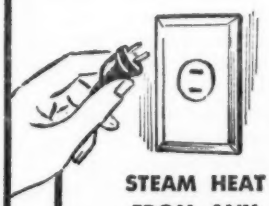
Helping the floor salesman was a system of Magoni's for "second sales" to good accounts. When customers stopped to the cashiers' windows be-

There's Gold in Them Thar CHILLS

EVERYONE WANTS TO BUY THE

Electresteem

PORTABLE RADIATOR



STEAM HEAT FROM ANY WALL PLUG

RETAIL PRICE $32.95

LIGHT...RIGHT...SELLS ON SIGHT!

Yes, even a frail woman can easily carry this Electresteem . . . plug it in and get quick, healthful, economical steam heat. Electresteem promotes traffic in your store, chalks up a plus profit . . . no service required. Dealers say, "it sells on sight" to folks with children in the home. Also ideal for doctor's offices, general office buildings, hospitals, cottages, shops, spare or recreation rooms. Get on the profit beam with Electresteem!

BACKED BY THE POWER AND PERSUASION OF PERSISTENT *National Advertising*

Electresteem Advertising Appears Consistently in:

American Home • Parents' Magazine • Modern Baby • Better Homes and Gardens • Hygeia • Baby's Own Story • Good Housekeeping • Baby Care Manual • House Beautiful • My Baby • House and Garden • Baby Talk • Southern Home and Garden • So You're Going To Have a Baby

ELECTRIC STEAM RADIATOR CORP.

DETROIT 8, MICHIGAN

kind the department, a signal was flashed to Magoni's office if the customer was a "good" account, nearly paid on her last purchase.

"Good evening," said a salesman as she stepped from the window, "have you seen our new washers?"

Launching his sales talk, he pointed out that she could buy the new item with not an additional penny of down payment, simply continuing her existing installments a little longer. This appeal worked with three out of ten customers, a percentage of which Magoni is very proud, since a national average for such selling was considerably lower.

Magoni is planning a return to these proven selling methods. He believes in strong individual salesmanship from his staff, backed by powerful store displays and advertising. With his plans already made down to the last detail, he is ready to swing into sales action the instant he has appliances to sell. Thorough wartime planning will pay him off in *plus* post-reconversion volume figures.

Electrical Features of "Big Inch" Pipeline

(Continued from page 13)

circulation of this air as a means of heating the station in cold weather.

The motor room is completely separated from the pump room by a fire wall, with no communicating doorways, it being necessary to go outside the building when passing from the one room to the other. With this arrangement the motor room is maintained nonhazardous, and the equipment and installation in this room are of conventional type for nonhazardous location as shown in Figure 4.

The pumps are surprisingly compact. They are single stage, 16 by 12, rated 8,750 gallons per minute, 648 feet head, at 1,780 rpm.

Each pump is equipped with a suction valve and a discharge valve. These are manually operated; the 16-inch suction valve requires 156 turns for its complete travel, and the 12-inch discharge valve 118 turns.

From the standpoint of electrical devices and wiring, the pump room is a hazardous atmosphere location, made so by normal drainage from the pump glands, by pump-casing venting operations, and by any abnormal leakage that may occur. The push buttons in the pump room for starting and stopping the units are of the explosion-proof type. Likewise the pressure-protective relays, of which more will be said later.

Having examined the component parts of a typical station, let us now consider their coordination and control. The main 24-inch pipe enters and leaves the station site at a "scraper box" where dead-end traps are located for the handling of incoming and outgoing scrapers, employed to clean the line. By suitable positioning, the stream is detoured around the scraper traps and through the station, where it receives the pressure increment developed by the pumps and resumes its travel along the line. Check valves permit bypassing the individual units or the station.

The starting and normal stopping of the stations and of units within stations are entirely by direction of the dispatcher, who is located in the headquarters office at Cincinnati. Continuous intercommunication between the dispatching office and all stations is provided by telephone with loud-speaker to permit conversation between the dispatcher and all operators.

Here electrical control performs a superior job, for the operator has at a central location in the pump room, grouped with the principal pressure gauges the three push buttons controlling the pump units. So in prompt compliance to the dispatcher's instructions, and without having to lift his glance from a gauge he can operate a push-button to start or stop each unit. When starting up, the pump is up to speed within ten seconds and ready for its discharge valve to be opened. Flexibility and speed in starting and stopping are important contributions by electrical control to the operation of the line.

Of still more importance is the adaptability of electrical control to protective shutdown functions. As already indicated, it is necessary at all times to hold the operating pressures between definite limits of low suction and high discharge pressures.

Low suction pressure permits vaporization of the liquid in the pump casing, followed quickly by possible damage to the pump through gland heating and unbalance. To guard against this, a relay is provided, hav-

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ing a pressure element connected to the station suction. Its contacts sound an alarm at about 35 pounds per square inch, thus warning the operator, who may be able to correct conditions by throttling adjustment. Failing this, a second low-pressure relay functions at about 20 pounds per square inch to cause shutdown. Both of these devices are adjustable to higher or lower settings.

To prevent unnecessary shut-down of the full station capacity, this shutdown relay is arranged to stop the units in timed sequence, beginning with the down-stream unit, with an interval of about five seconds between shutdowns. If upon shutting down a unit, the station suction pressure rises above the reset point of the protective relay, the remaining units are allowed to continue in operation. However, if the suction pressure persists below the protective-relay setting, the remaining units are stopped automatically in sequence at five second intervals.

Protective Devices

Protection against excessively high line pressure at the station discharge is provided by a pressure-actuated relay, similar to the low-suction-pressure relay, and set to function when pressure exceeds about 750 pounds per square inch. For additional protection of station equipment and piping, a pressure relay between unit 2 and unit 3 will allow a pressure at this point not more than 300 pounds per square inch above normal discharge pressure of unit 2. This high-pressure protective relay also will shut down successive units in timed sequence.

In event of a protective shutdown due to abnormal pressure, the operator may have difficulty in identifying the particular relay that functioned. To provide this information quickly, a visible annunciator was designed, for mounting right in the pump room, in an explosion-proof housing, adjoining the station pressure gauges and the push buttons which control the three pump units.

With these protective devices, the station can operate at a wide range of pressure conditions within the limits for which the devices are set, and yet have the benefit of protective shutdown when some abnormal condition results in pressures exceeding the prescribed limits.

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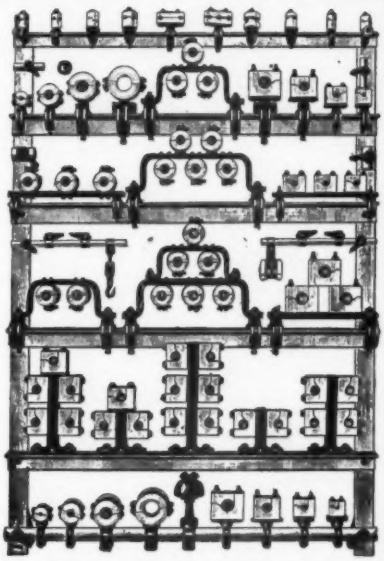

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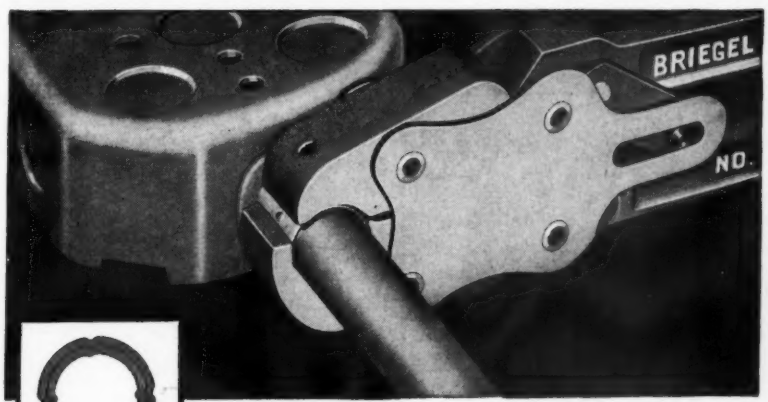

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